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The CITY THAT WAS

by

STEPHEN SMITH M.D.

SOUVENIR EDITION

ISSUED AT THE SEMI-CENTENNIAL MEETINGS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION IN HONOR OF THE APPROACHING CENTENNIAL OF DR. SMITH FOUNDER OF THE ASSOCIATION

THE CITY THAT WAS

PUBLIC SCHOOL ADJOINING SLAUGHTER-PEN, 1865

THE CITY THAT WAS

By STEPHEN SMITH, A. M., M. D., LL. D.

COMMISSIONER OF THE METROPOLITAN BOARD OF HEALTH, 1868-1870;
COMMISSIONER OF THE BOARD OF HEALTH OF NEW YORK, 1870-1875

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NUMBER THREE WEST FORTY-SECOND STREET, NEW YORK

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To the Memory of

Dorman Bridgman Eaton

My thanks are due especially to Mr. Frank Allaben and my son, Mr. Sidney Smith, for their service in carrying this book through the press.

STEPHEN SMITH.

PREFACE

THROUGH the courtesy of Dr. Stephen Smith and his family, the American Public Health Association is able to publish, in honor of Dr. Smith, a souvenir edition of *The City That Was,* of which he is the author.

Dr. Smith will always be honored for his great and pioneer work as a sanitarian. He blazed the trail which others have followed, and through his vision, no less than his labors, health and happiness have been brought to countless thousands. The publisher has rightly called this book "the story of a great life-saving social revolution, the mightiest in the nineteenth century, and one of the most momentous in the history of civilization." In this revolution Dr. Smith was one of the leaders, and largely through his activities was it brought to a successful issue.

In 1864, Dr. Smith was made a member of the "Council of Hygiene" of New York City. The investigations of the Council were organized and supervised by him, and its report in 1865 so impressed and aroused the public by its revelations as to bring about the act of legislature, April 21, 1866, creating the Metropolitan Board of Health, endowed with almost autocratic powers. Dr. Smith was appointed a commissioner of the Board by Governor Fenton, and through successive reappointments remained a commissioner until 1875.

When Dr. Smith began his work, New York was an unhealthy city, with a death-rate of 38 per 1,000, which meant approximately 23,000 deaths each year from preventable diseases. In spite of the enormous growth of New York, and the constant influx of immigrants from all parts of the world, New York is

now a healthy city, with a death-rate of about 12 per 1,000, a saving of approximately 145,000 lives each year.

To have been instrumental in bringing about such a change is an honor which is justly due to Dr. Smith, who was not only a pioneer in the movement, but who also, throughout his life, has given freely of his time and services to the welfare of his fellow citizens.

While we recognize his many claims to eminence as surgeon, author, and citizen, it is as pioneer sanitarian that the American Public Health Association likes most to think of him and to honor him.

Mazÿck P. Ravenel, M. D.
President, American Public Health Association

NOTE BY THE PUBLISHER

THE story of a great life-saving social revolution, the mightiest in the nineteenth century and one of the most momentous in the history of civilization, is told here for the first time. It is told from the standpoint of the transformation of the City of New York, by a chief actor in the event.

Only by forcing ourselves into a receptive mood can we of the present credit the half of what is set before us concerning The City That Was. The shocked imagination rebels. It seeks relief in assuming that even a trained expert, a contemporaneous witness and investigator of the conditions described, in writing after they have passed away, unconsciously yields to the historian's temptation to throw the past into dramatic relief by starting exaggerations.

Dr. Smith, however, leaves us no room for doubt. The appalling chapter in which he lays bare the New York of 1864 is a contemporaneous document. It is a physician's report of a systematic medical inspection of New York in that year, as delivered before a Legislative Committee a few months later by the very physician who had directed the inspection.

Nevertheless, The City That Was is not New York alone. She is but a type. Her condition, with variations, may be multiplied, during the early years of the nineteenth century, by the total of the cities, towns, and villages in the world. In the work of regeneration some of these anticipated her. Others, including all throughout the territory of the United States, were aroused through her agitation and inspired by her example.

As a student of local history, the writer thought himself familiar with the many phases of the growth of New York; but the condition of the City as late as the period of our Civil War, as here depicted,

startled him as might a revelation. He believes that no seriously minded man or woman can afford to ignore this volume. We owe it to ourselves and to one another fully to face its lesson.

We shall be shocked; we shall be filled with horror; but accepting the city that now is, great as her faults may be, with a new gratitude, we shall turn with anointed sympathy and understanding to any earnest voice that pleads for the city that should be. And, indeed, other volumes which Dr. Smith himself has in preparation, as suggestive and as interesting as this one, may help us on in this direction.

FRANK ALLABEN

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I

A Blind Metropolis and Her Dying Children

A GREAT problem was left for the first civilized inhabitants of New York to determine. Nature had made ample provision for the metropolis of the western hemisphere. But two possibilities were attached to its occupation by man — it could be healthy or unhealthy, at the option of the people.

Healthy or Unhealthy: Which?

THE conditions which made for health were: two large rivers of pure water, from the mountains and the sea, flushed its shores, carrying the outflow of its waste far away seaward; its soil could be thoroughly drained; its sewerage could be so constructed as to convey to the sea all forms of domestic waste and surface filth; its southern exposure towards the ocean insured sunlight and sea breezes; its inland situation supplied to its atmosphere the life-giving virtues of abundant vegetation; the climate was temperate.

The conditions which made for unhealthiness were: large areas of sodden marsh lands; a rock formation of shale, having a dip of the strata, nearly perpendicular, admitting the flow of surface water to great depths, thus poisoning springs and wells; numerous streams flowing into the rivers; large ponds of stagnant water; fierce summer heat.

Two Centuries and a Half Unhealthy

FROM the year 1622 to the year 1866, a period of two hundred and forty-four years, the people elected that the city should be unhealthy. The land was practically undrained; the drinking water was from shallow wells, befouled by street, stable, privy, and other filth; there were no adequate sewers to remove the accumulating waste; the streets were the receptacles of garbage; offensive trades were located among the dwellings; the natural water courses and springs were obstructed in the construction of streets and dwellings, thus causing soakage of large areas of land, and stagnant pools of polluted water.

Later, in these centuries of neglect of sanitary precautions, came the immigrants from every nation of the world, representing for the most part the poorest and most ignorant class of their respective nationalities. This influx of people led to the construction of the tenement house by

landowners, whose aim was to build so as to incur the least possible expense and accommodate the greatest possible number. In dark, unventilated, uninhabitable structures these wretched, persecuted people were herded together, in cellars and garrets, as well as in the body of the building, until New York had the largest population to a square acre of any civilized city.

The people had not only chosen to conserve all the natural conditions unfavorable to health, but had steadily added unhygienic factors in their methods of developing the city.

A Plague-Stricken Town

THE result was inevitable. New York gradually became the natural home of every variety of contagious disease, and the favorite resort of foreign pestilences. Smallpox, scarlet fever, measles, diphtheria, were domestic pestilences with which the people were so familiar that they regarded them as necessary features of childhood. Malarial fevers, caused by the mosquitoes bred in the marshes, which were perfect culture-beds, were regularly announced in the autumnal months as having appeared with their "usual severity." The "White Plague," or consumption, was the common inheritance of the poor and rich alike.

With the immigrant, came typhus and ty-

phoid fevers, which resistlessly swept through the tenement houses, decimating the poverty-stricken tenants. At intervals, the great oriental plague, Asiatic cholera, swooped down upon the city with fatal energy and gathered its enormous harvest of dead. Even "Yellow Fever," the great pestilence of the tropics, made occasional incursions and found a most congenial field for its operations.

Enormous Sacrifice of Life

FAILURE to improve the unhealthy conditions of the city, and the tendency to aggravate them by a large increase of the tenement-house population, offensive trades, accumulations of domestic waste, and the filth of streets, stables, and privy pits, then universal, caused an enormous sacrifice of life, especially among children. This fact is strikingly illustrated by the following comparison of figures taken from the official records.

The standard ratio of deaths to the total living in a community, where the death-rate is normal under proper sanitary conditions, has been fixed by competent authority at about 15 in 1,000 of population. The death-rate in New York, in the five years preceding 1866, averaged 38 in 1,000 population, which is 23 in excess of the normal standard of 15 in the 1,000. In a city with a population of 1,000,000, the estimated

population of New York in 1865, a death-rate of 38 in the 1,000 means 23,000 deaths annually from preventable diseases.

Mortality statistics computed on a scale of forty years, the period during which New York has been under an intelligent sanitary government, still more impressively show the former waste of life through municipal neglect of the elementary principles of public hygiene. The lesson which these figures teach should be engraven on the memory of every man, woman, and child. Our authority is the annual report of the Department of Health of the City of New York, for the year 1908, in which appears the following statement.

"A remarkable decrease in the death-rate has taken place within the past forty years, a decrease comparing each decennial rate with the one immediately preceding represented by seven, seven, and eighteen per cent respectively, and comparing that of the first decennium with the individual year under review, a decrease of forty-seven per cent."

II

A Great Awakening in England

HOLERA was approaching the shores of England. The alarm of the people was intense. The enormous devastations of that pestilence on its first and only previous visit to that country, in 1832, were vividly recalled by the elder people. The only known preventive measures were "flight, fasting, and prayer." As the pestilence was believed to be a "visitation of God" on account of the sins of the people, the clergy petitioned the Prime Minister to proclaim a day of "fasting and prayer," with many expressions of sorrow at the prevailing national vices which had finally provoked the wrath of the Almighty. The Prime Minister replied in substance as follows:

The Scourge of 1849

"Do works meet for repentance. First make your homes and their surroundings clean and wholesome; then you may with propriety ask Almighty God to bless your efforts at protection against the approaching epidemic."

This response of the highest official of the

Kingdom to the usually humble and devout petition of the clergy, when the people were threatened with an epidemic, was received with profound astonishment by the religious classes, with ridicule by the masses of the people, but with commendation by sanitarians. The popular agitation was great. The clergy protested with solemn asseverations their belief that pestilences were always indications that national sins had become intolerable to the Almighty, and only fastings and prayers could appease His wrath.

The people at large gave no heed either to the clergy's admonition to fast and pray, or to the Prime Minister's advice to clean their homes and their surroundings; but, with their usual disregard of the domestic diseases with which they were constantly familiar, gave no thought to approaching danger. But the sanitarians very earnestly urged the people of their respective localities to act upon the advice of the Prime Minister, assuring them that cholera was a disease which prevailed more generally and severely in localities and homes where there was the greatest amount of "filth."

The epidemic of 1849 came and went with its apparent usual great disturbances of the people. "Flight" and "fasting and prayers" had their natural results, the former being effectual when undertaken in time, and the latter without sensible influence over the mortuary records.

THEN the net results of this visitation of cholera were officially determined by the Registrar General, one fact attracted wide attention and created a profound and lasting impression on the minds of the common people. A town in the interior of England reported no case of cholera, though the epidemic had prevailed with great virulence in the communities surrounding it.

Can Diseases Be Prevented?

On inquiry as to the cause of this remarkable feature of a pestilence that hitherto had shown no respect for persons or localities, it was learned that certain citizens of this town were deeply impressed with the reasonableness of the Prime Minister's suggestions, and had organized and taken action accordingly. Volunteer committees composed of the leading men and women were selected. One was to secure thorough cleaning of the streets and public places; another was to cause an inspection of every residence and its surroundings and secure complete cleanliness; a third was to obtain reports of all cases of sickness and require immediate isolation and treatment when there was the slightest symptom of cholera.

This town had its "fastings and prayers," but not until its citizens had done works meet for repentance; and then it asked the divine blessing on its efforts to protect itself — and its prayers were abundantly answered.

But there was another phase of this place's experience not less impressive than its escape from cholera. There was a great diminution of such diseases as diphtheria, typhoid, erysipelas, scarlet fever, measles, and other low forms of sickness, so fatal in the homes of the poor, during the period that the citizens exercised so much care in securing cleanliness.

The Word Fitly Spoken

"A WORD fitly spoken is like apples of gold in pictures of silver." A word fitly spoken broke the spell of centuries, and completely revolutionized human history. That word was spoken, not at the suggestion of science, nor by a scientist, but, at the dictation of common sense, by a layman who happened to be in authority. It was a plain, simple word, which was understood by the people and which appealed to their common sense.

A new era now dawned upon the domestic life of the English people. Every household learned that cleanliness had not only saved a town from a visitation of cholera, but had reduced the contagious and infectious diseases always present in their homes. The Health Officer of England gave tremendous force to the revelation that had been made by officially characterizing and classifying cholera and the whole brood of domestic scourges as "filth diseases." This was

a most happy term, because it suggested not only the source of these diseases, but the simple and effectual remedy that every householder could apply. It became popular in the sanitary literature of the period, and thus permeated all classes, until the most humble family knew its import and complied with its suggestion.

The next visitation of cholera to England was met by the simple remedy of domestic and civic cleanliness; and so manifestly effectual was this measure that the pestilence lost its former terrors. But the great and lasting gain to the people, which grew out of the original proclamation of the Prime Minister that cleanliness of the home and its surroundings was the best preventive of cholera, was the discovery of the fact that nearly all diseases which afflict the individual family, and in a larger sense the whole community, have their origin in or are intensified by decomposing waste matter, the "filth" of the sanitarian, in and around their homes.

So profoundly impressed with this fact were the laboring classes, and so earnest did they become in their zeal for sanitation, that sanitary measures entered into the political campaign. On one occasion a prominent candidate was so disturbed by the numerous inquiries which the audience made as to his views in relation to current questions of local sanitation, that he cried out in despair, *"Sanitas sanitatum, et omnia sanitas!"*

III

The Awakening in America

URING the score of years that the great awakening of the people of England to the value of cleanliness of the individual, the home, and the municipality, as the true remedial measure against foreign as well as domestic pestilences was in progress, extending from 1846 to 1866, the people of the United States remained profoundly apathetic in relation to all questions of improvement of the public health and the prevention of epidemics. Cholera ravaged their cities in 1849, and again in 1854, without meeting other obstruction than the occasional fumes of sulphur. Days of fasting and prayer were religiously observed; but, for the most part, the terror-stricken people fled to the country to escape what they believed to be inevitable death if they remained in their town homes.

Apathy in the United States

The object lesson which the people of England had learned from the experience of one town, and had so successfully applied in several

visitations of epidemics, was known to a few students of sanitary science and administration in different parts of this country, and efforts had been made by them from time to time to awaken public interest in sanitation of the home and the municipality; but very little progress was made. A few cities had health organizations, which for the most part were devoted to political schemes and purposes, with no pretense to knowledge of the objects or methods of sanitation.

AS the simple suggestion of the Prime Minister, that cleanliness of the home and its surroundings was the best measure of protection against cholera, contained the germ of practical sanitary reform in England, so an incident in the writer's experience became the potential force that gave to New York a most complete system of health laws and ordinances, and an efficient administrative department of health. In a larger sense it may with justice be claimed that this incident contained the germ of health reform that has given to this entire country the most perfect system of municipal, state, and national health administration in the civilized world.

An Incident That Counted

The incident referred to occurred in the fifties of the last century. New York was in the grip of the deadly typhus. This was sometimes called

the "Spotted Fever," from the dark spots which appeared on the body of its victims, and also "Emigrant Fever," because it was brought to this country by the immigrants, especially by those who came from Ireland. Indeed, the Irish immigrants suffered so generally and severely that the disease was sometimes called the "Irish Fever." Immigration from Ireland was at that time at its flood, and the typhus was so prevalent among these poverty-stricken people that the hospitals were overcrowded by them, and large numbers were treated in tents, both on Blackwell's Island and at the quarantine grounds on Staten Island.

Having completed a two years' term of service on the interne medical staff of Bellevue Hospital, where large numbers of typhus cases were treated, I was placed in charge of the tents on Blackwell's Island by the Commissioners of Charities. Soon after entering upon the service, I noticed that patients were continually admitted from a single building in East Twenty-second Street.

IMPRESSED with the importance of closing this fever-nest, I visited the tenement, and was not surprised at the large number of cases of fever which it furnished our hospital. It is difficult to describe the scene that the interior of the house presented to the visitor. The building was in an extreme state of dilapidation

generally; the doors and windows were broken; the cellar was partly filled with filthy sewage; the floors were littered with decomposing straw, which the occupants used for bedding; every available place, from cellar to garret, was crowded with immigrants — men, women, and children. The whole establishment was reeking with filth, and the atmosphere was heavy with the sickening odor of the deadly typhus, which reigned supreme in every room.

A Fever Nest

The necessity of immediately closing this house to further occupation by immigrants, until it was thoroughly cleansed and made decently habitable, was imperative, and I made inquiries for the responsible owner. I found that the house was never visited by anyone who claimed to be either agent or owner; but that it was the resort of vagrants, especially of the most recent and destitute immigrants; that they came and went without let or hindrance, generally remaining until attacked by the prevailing epidemic of fever, when they were removed to the fever hospital.

AFTER considerable inquiry in the neighborhood I found a person who was the real agent of the landlord; but no other information could be obtained than that the owner took no interest in the property, and that the agent was under instructions not to reveal the owner's

name. A suggestion to this agent, to have the house vacated and put in good condition for tenants, was refused with a contemptuous remark as to the absurdity of furnishing such vagrants and immigrants better quarters in which to live.

The Unknown Owner

As there was no Health Department to which an appeal could be made, the Metropolitan Police Department was visited and the matter laid before its president, Mr. Acton. He directed the secretary, Mr. Hawley, a lawyer, to examine the health laws and ordinances to determine what measures were in the power of the police to enforce. A search was made, and the result was that neither law nor ordinance under which the police could take action was found. Mr. Acton advised that the tax lists be examined, to find who paid taxes on the property, and thus discover the responsible party to its ownership, and then that appeal be made directly to him to authorize the necessary improvements. An examination of the tax list revealed that the owner was a wealthy man, living in an aristocratic neighborhood, a member of one of the most popular churches of the city.

The condition of his tenement house was brought to his attention, and its menace to the public health as a fruitful fever nest was explained. He was very angry at what he declared was an interference with the management of his

property, and asserted, in the most emphatic manner, that as the house yielded him no rent, he would not expend a dollar for the benefit of the miserable creatures who had so wrecked the building.

With the failure of this appeal to the owner, I had exhausted, apparently, every legal and moral means of abating a nuisance dangerous to life and detrimental to health.

IN this extremity I visited the office of the *Evening Post* and explained the matter to Mr. William Cullen Bryant, then editor of that newspaper. He was at once interested in the failure of the power of the City Government to remedy such a flagrant evil. In the absence of laws and ordinances, Mr. Bryant proposed to make the case public in all of its details, and for that purpose suggested that the police should cause the arrest of the delinquent owner, and he would send a reporter to make notes of the case. A charge was made against the landlord, and he was required to appear at the Jefferson Market Court. On entering the court he was confronted by the reporter, pad and pencil in hand, who pressed him with questions as to his tenement house.

Fear of Publicity

Greatly alarmed at his situation, the owner inquired as to the purpose of the reporter, and was informed that Mr. Bryant intended to pub-

lish the proceedings of the court in the *Evening Post,* and to expose his maintenance of a fever nest of the worst description. He begged that no further proceedings be taken, and promised the court that he would immediately make all necessary improvements. He promptly vacated the house, and made such a thorough reconstruction of the entire establishment that it became one of the most attractive tenements in that East Side district. For many years that house continued to be entirely free from the ordinary contagious diseases of the tenement houses of the city. It is an interesting fact that the landlord subsequently thanked the writer for having compelled him to improve his tenement house; for he had secured first-class tenants who paid him high rents.

THIS incident came to the attention of several prominent citizens, physicians, lawyers, and clergymen, who became profoundly impressed with the revelation that there were no laws under which such a glaring violation of the simplest principles of health, and even of common decency, could be at once corrected.

Agitation for Reform

For many years there had been a growing sentiment in favor of a reform of our health regulations, stimulated by the writings of Dr. John H. Griscom, Dr. Joseph M. Smith, Dr. Elisha Harris, and others, and the Academy of

Medicine had occasionally passed resolutions favoring adequate health laws; but no results had been secured.

It was now resolved to organize a society devoted expressly to sanitary reform, and the "Sanitary Association" came into existence. For several years this body annually introduced a health bill into the Legislature, but the measure was regularly defeated through the active opposition of the City Inspector, whose office would be abolished if the bill became a law.

The Citizens Association

IN the early sixties the famous "Citizens Association" was organized, with Peter Cooper as President, and a membership of one hundred of the most prominent citizens. This was in the days of the Tweed régime, and at a period when the City Government was most completely in his power. The objects of the Association were reform in all branches of the Municipal Government, the promotion of wise legislation, and the defeat of all attempts to subordinate the city to the schemes for control by Tweed and the coterie of politicians who were under his directions.

The friends of sanitary reform decided to attempt to secure proper legislation through the Citizens Association. The application, by a delegation, for the aid of this Association was well received and a plan of procedure adopted. The

secretary of the Citizens Association, Mr. Nathaniel Sands, had been a member of the Sanitary Association, and as an enthusiastic sanitarian had been disappointed at its repeated failure to secure legislation. At his suggestion, it was decided to create two committees, one on health and another on law, and through these agencies to have the Citizens Association accomplish its work. The first committee eventually came under my direction, while the second was directed by Dorman B. Eaton, Esq.

In the Committee on Public Health were many of the more prominent medical men of that period, as Dr. Valentine Mott, Dr. Joseph M. Smith, Dr. James R. Wood, Prof. John W. Draper, Dr. Willard Parker, Dr. Isaac E. Taylor. The Committee on Law was equally distinguished for its membership, having on its list the names of William M. Evarts, Charles Tracy, D. B. Silliman.

A Health Bill

IT was determined, as a preliminary step, to prepare a "Health Bill" and introduce it into the Legislature, which was that of 1864, and thus learn the obstacles to be met; for efforts had repeatedly been made to pass health bills without success. The bill was drawn along the lines of previous bills, and was altogether inadequate in its provisions to effect the required reforms. The effort, however, developed the fact

that the real opposition to health legislation was the City Inspector's Department. As that department exercised all of the health powers, any proper health bill would abolish it altogether.

The City Inspector, at that time, was a grossly ignorant politician, but as he had upwards of one million of dollars at his disposal, he had a prevailing influence in the Legislature when any bill affected his interests. At the hearing on the Association's bill, the City Inspector's agents denied every allegation as to the unsanitary condition of the city, and as the Association had no definite information as to the facts asserted, the bill failed, as had all the bills of the Sanitary Association during the previous ten years.

Sanitary Inspection of New York

IN conference it was now decided to make a thorough sanitary inspection of the city by a corps of competent physicians, draft a new and much more comprehensive measure, and thus be prepared to confront the City Inspector with reliable facts in regard to the actual condition of the city. The Citizens' Association consented to bear the expense of the undertaking.

Under the auspices of the Association, and in the absence of the secretary of the Committee on Health, Dr. Elisha Harris, who was at that

time in the service of the United States Sanitary Association, I organized and supervised the inspection. The corps of inspectors consisted of young physicians, each assigned to one of the districts into which the city was divided. The work was completed during the summer months of 1864, and the original reports of the inspectors were bound in seventeen large folio volumes. These reports were afterwards edited by the secretary, Dr. Elisha Harris, and published by the Association in a volume of over 500 pages. The total cost to the Association of this inspection and publication was $22,000; but it richly repaid the Association, for it accomplished the object for which it was undertaken.

This volunteer sanitary inspection of a great city was regarded by European health authorities as the most remarkable and creditable in the history of municipal reform. Too much credit can not be given to the President of the Association, Peter Cooper, and to the Secretary, Nathaniel Sands, for the constant support which they gave the Committee on Health in the prosecution of this great undertaking.

Meantime the Committee on Law perfected a bill to be introduced at the coming session of the Legislature, 1865. It was the joint product of the Medical and Law Committees, and was made the subject of extensive study and research, in order to embody in it every provision essential to its practical operations.

At the request of the Committees I made the first draft for the purpose of embodying the sanitary features as the basis of the bill. Former health bills were restricted in their operations to the city of New York, and the officers were appointed by the Mayor. As the government of the city was dominated in all of its departments by Tweed, it was decided to place the proposed new health organization under the control of the State, by making a Metropolitan Health District, the area of which should be co-extensive with that of the Metropolitan Police District. This feature of the bill was also important because the protection of the city from contagious diseases in outlying districts required that the jurisdiction of the Board should extend to contiguous populations.

The original draft having been approved by the Committee on Health, Mr. Eaton was requested to perfect the bill by adding the legal provisions. As he had recently made a study of the English health laws, he incorporated many items especially relating to the powers of the Board which were quite novel in this country.

ONE feature of the bill deserves mention; for it is an anomaly in legislation and apparently violates the most sacred principle of justice; viz., the power of the courts to review the proceedings of a health board. The Committees concluded that a board which was au-

thorized to abate nuisances "dangerous to life and detrimental to health" should not be subjected to the possible liability of being interrupted in its efforts to abate them by an injunction that would delay its action. Accordingly the law as so drawn that the Metropolitan Board was empowered to create ordinances, to execute them in its own time and manner, and to sit in judgment on its own acts, without the possibility of being interrupted by review proceedings or injunctions by any court.

An Anomaly in Law

Its power was made autocratic. The language of that portion of the bill conveying these powers was purposely made very technical, in order that only a legal mind could interpret its full meaning, it being believed that the ordinary legislator would not favor the measure if he understood its entire import. It is an interesting fact that the first case brought into court under the law was an effort to prove the unconstitutionality of this feature; but it was carried to the Court of Appeals, and its constitutionality was sustained by a majority of one.

ON the assembling of the Legislature of 1865 the Metropolitan Health Bill was formally introduced into both houses, and preparations made to secure its passage. Mr. Eaton was selected by the Citizens' Association to advocate the legal provisions of the bill at the hearings

before the committees of the Legislature, and I was delegated to explain the sanitary requirements of the measure. The first hearing occurred on the thirteenth of February, before a joint committee of both houses, Hon. Andrew D. White, senator, presiding. A large audience was present, including the City Inspector and the usual retinue of office holders in his department. The Citizens Association was represented by Rev. Henry W. Bellows, Dr. James R. Wood, Dr. Willard Parker, Prof. John W. Draper, and several other prominent citizens, in addition to Mr. Eaton and myself.

Introduction of an Epoch-Making Bill

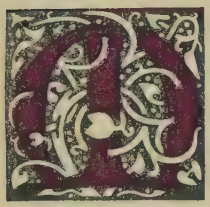
Mr. Eaton first addressed the committee, and made an admirable presentation of the legal features of the bill. He eloquently appealed for its enactment into law, in order to create in New York a competent health authority, with power to relieve the city of its gross sanitary evils and adopt and enforce measures for the promotion of the public health.

I followed him, my task being to show, from the existing condition of the city, the imperative need of such legislation. My remarks on the occasion were published in *The New York Times* of March 16, 1865.

IV

New York, the Unclean

The illustrations in this chapter, with the frontispiece of the book, have all been reproduced from the elaborate report published by the Council of Hygiene of the Citizens' Association. My address before the Legislative Committee is here given as it then appeared in *The New York Times* of March 13, 1865, with the correction of some typographical errors. It consisted of a detailed presentation of the facts recorded and sworn to by the medical inspectors employed by the Citizens' Association, together with photographic illustrations which were made by them.



R. CHAIRMAN: I have been requested to lay before you some of the results of a sanitary inspection of New York City, undertaken and prosecuted to a successful completion by a voluntary organization of citizens. There has long been a settled conviction in the minds of the medical men of New York, that that city is laboring under sanitary evils of which it might be relieved. This opinion is not mere conjecture, but it is based upon the daily observations which they are accustomed to make in the pursuit of professional duties.

Alarm of Medical Men

Familiar, by daily study, with the causes of diseases, and the laws which govern their spread, they have seen yearly accumulating about and within the homes of the laboring classes all the recognized causes of the most preventible diseases, without a solitary measure being taken by those in authority to apply an effectual remedy. They have seen the poor

crowded into closer and closer quarters, until the system has actually become one of tenant-house packing. They have witnessed the prevalence of terrible and fatal epidemics, having their origin in or intensified by these conditions, and many of their professional brethren have perished in the courageous performance of their duties to the poor and suffering.

Cognizant of these growing evils, and believing that they are susceptible of removal, they have repeatedly and publicly protested against the longer tolerance of such manifest causes of disease and death in our city. Large bodies of influential citizens have been equally impressed with the importance of radical reform in the health organizations of New York, and have strenuously labored, but in vain, to obtain proper legislative enactments.

A Systematic Investigation

TO give practical effect to their efforts, it was determined in May last to undertake a systematic investigation of the sanitary condition of the city. For this purpose a central organization was formed, and when I mention the names of its leading members, I give you the best assurance that the work was undertaken in the interests of science and humanity. The president was Dr. Joseph M. Smith, one of the ablest writers on sanitary science in this country, and among its members were

Drs. Valentine Mott, James Anderson, Willard Parker, Alonzo Clark, Gurdon Buck, James R. Wood, Charles Henschel, Alfred C. Post, Isaac E. Taylor, John W. Draper, R. Ogden Doremus, Henry Goulden, Henry D. Bulkley, and Elisha Harris.

In prosecuting this inquiry the Association was guided by the experience of similar organizations in Great Britain, where sanitary science is now cultivated with the greatest zeal, and is yielding the richest fruits. As a preliminary step to the introduction of sanitary reforms, many of the populous towns of England made a more or less complete inspection of the homes of the people to determine their condition, and to enable them to arrive at correct conclusions as to the required remedial measures. The English Government undertook a similar investigation through its "Commissioners for Inquiring into the State of Large Towns and Populous Districts," and the voluminous and exhaustive reports of that Commission laid the foundation of the admirable sanitary system of that country.

The first object of sanitary organization was apparently, therefore, to obtain detailed information as to the existing causes of disease and the mortality of the population, and as to the special incidence of that mortality upon each sex, and each age, on separate places, on various occupations; in fact, to present

a detailed account of what may be called, in commercial phrase, our transactions in human life.

EVIDENTLY the best method of arriving at such knowledge was by a systematic inspection. And that inspection must be a house-to-house visitation, in which the course of inquiry not only developed all the facts relating to the sanitary, but equally to the social condition of the people. It must necessarily be required of the inspector that he visit every house, and every family in the house, and learn by personal examination, inquiry, and observation, every circumstance, external and internal to the domicile, bearing upon the health of the individual.

A House-to-House Inspection

To perform such service satisfactorily, skilled labor must be employed. No student of general science, much less a common artisan, was qualified to undertake this investigation into the causes of disease; however patent these causes might be, he had no power to appreciate their real significance. Minds trained by education, and long experience in observing and treating the diseases of the laboring classes, could alone thoroughly and properly accomplish the work proposed.

HAPPILY, experts were at hand and prepared to enter upon the task, viz.: the dispensary physicians. The daily duties of these practitioners have been for years to practice among the poor, and study minutely their diseases; and thus they have gained an extensive and accurate knowledge of the sanitary and social condition of the mass of the people. Many of these practitioners have been engaged in dispensary service, and in a single district, for ten to twenty years. They have thus become so familiar with the poor of their district, though often numbering 40,000 to 50,000, that they know the peculiarities of each house, the class of disease prevalent each month of the year, and to a large extent the habits, character, etc., of the families which occupy them.

The Medical Experts

From this class of medical men the Council selected, as far as possible, its corps of Inspectors. As a body, they represent the best medical talent of the junior portion of the profession of New York. Many occupy high social positions, and all were men of refinement, education, and devotion to duty. They entered upon the work with the utmost enthusiasm; engaging in it as a purely scientific study.

Everywhere the people welcomed the Inspectors, invited them to examine their homes, and gave them the most ample details.

THE plan of inspection adopted by the Council was as follows: The city was divided into thirty-one districts and an Inspector selected for each, care being taken to assign to each inspector a district with which he was most familiar. The Inspector was directed to commence his inspection by first traversing the whole district, to learn its general and topographical peculiarities. He was then to take up the squares in detail, examining them consecutively as they lie in belts.

Plan of Inspection

Commencing at a given corner of his district, he was first to go around the square and note: 1. Nature of the ground. 2. Drainage and sewerage. 3. Number of houses in the square. 4. Vacant lots and their sanitary condition. 5. Courts and alleys. 6. Rear buildings. 7. Number of tenement houses. 11. Drinking shops, brothels, gambling saloons, etc. 12. Stores and markets. 13. Factories, schools, crowded buildings. 14. Slaughter-houses (describe particularly). 15. Bone and offal nuisances. 16. Stables, etc. 17. Churches and school edifices.

Returning to the point of starting, he was to commence a detailed inspection of each building, noting: *a.* Condition and material of buildings. *b.* Number of stories and their height. *c.* Number of families intended to be accommodated, and space allotted to each. *d.* Water supply and house drainage. *e.* Location and

character of water-closets. *f*. Disposal of garbage and house slops. *g*. Ventilation, external and internal. *h*. Cellars and basements, and their population. *i*. Conditions of halls and passages. *j*. Frontage on street, court, alley — N., E., S. or W. 18. Prevailing character of the population. 19. Prevailing sickness and mortality. 20. Sources of preventible disease and mortality. 21. Condition of streets and pavements. 22. Miscellaneous information.

Each Room Examined

HE entered each room, examined its means of ventilation and its contents, noted the number of occupants by day and by night, and carefully estimated the cubical area to each person. Whenever any contagious or infectious disease was discovered, as fever, smallpox, measles, scarlatina, the Inspector made a special report upon the dwelling. This report embodied specific answers to a series of questions, furnished in a blank form, requiring him 1. To trace and record the medical history of the sick person. 2. To ascertain and record facts relating to the family and other persons exposed to the patients and to the causes of the malady. 3. To report the sanitary condition of the domicil. 4. To report the statistics and sanitary condition of the population of that domicil. 5. To report upon the sanitary condition of the locality or neighborhood and

its population. 6. To preserve and make returns of these records. 7. To prepare on the spot the necessary outlines or data for the sketching of a map or descriptive chart of the domicil, block, or locality.

Each Inspector was supplied with a note-book and a permanent record-book; in the first he constantly made notes as his examination proceeded, and in the latter these notes were expanded and put on permanent record. These permanent record-books are the property of the Association and embrace for the most part minute details concerning every building and tenement occupied by the laboring classes, as also, grog-shops, stables, vacant lots, slaughter-houses, etc.

Each Inspector was furnished with materials for drawing, and was directed to make accurate drawings of the squares in his district, locating each building, vacant lot, etc., and distinguishing the character and condition of each by an appropriate color. Many of these drafts of districts are beautiful specimens of art, and as sanitary charts enable the observer to locate infectious and contagious diseases, and with the aid of the permanent records, to determine the internal and external domiciliary conditions under which they occur.

I have been thus minute in specifying the details of the plan of inspection, the qualifications of the Inspectors, and the means employed, in

order that the character of the work and the value of the results obtained may be properly appreciated.

EARLY in the month of May the work of thoroughly inspecting the insalubrious quarters, where fever and other pestilential diseases prevail, had been commenced, and the fact was soon ascertained that smallpox and typhus fever were existing and spreading in almost every crowded locality of the city. It was not until about the middle of July that the entire corps of Inspectors was engaged. The work was then prosecuted with vigor and without interruption to the middle of November, when it was completed. The Inspectors met regularly every Saturday evening to report to a committee on the part of the Council the progress of their work, and to receive advice and instruction in regard to all questions of a doubtful character.

Period of the Inspection

On the completion of the inspection each Inspector was required to prepare a final report embodying the general results of his labors. These reports have all been properly collated, under the direction of the Association, and are now passing through the press. They will soon appear in an octavo volume of about 400 pages, largely illustrated, with maps and diagrams. It will be the first interior view of the sanitary and

social condition of the population of New York, and will abundantly demonstrate the fact that, though a great and prosperous commercial centre, she does not afford happy homes to hundreds of thousands.

Distribution of Population

BEFORE proceeding to an analysis of this work, it will be necessary to notice the topographical peculiarities of our city, and the distribution of its population. New York is an island having an area of about thirty-four square miles, inclusive of its parks. Unlike Philadelphia, London, and most other large cities, which have a background of hundreds of square miles upon which to extend according to the exigencies of the population or of business, New York is limited in its power of expansion, and must accomodate itself to its given area. While it is true that a large business population will gather upon the adjacent shores, it is equally true that these non-residents will be of the better class. The laboring population will, for the most part, remain upon the island, and must be accommodated in the city proper, as they are compelled to live near their work.

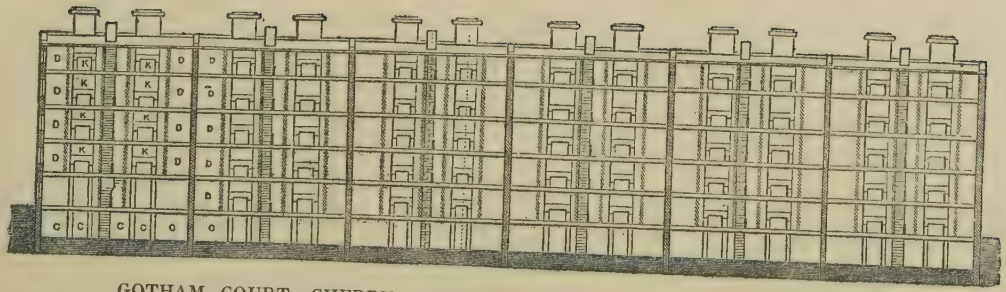
New York has, thus far, grown without any control or supervision, until its population is estimated at 1,000,000 of persons. Of this number, at least one-half are of the laboring and de-

pendant classes, compelled to live under such conditions as they find in their homes, without any power, either to change or improve them. Following the natural law which governs the movements of such a population, the wealthier or independent class spreads itself with its business arrangements over the larger proportion of the area, and the poorer or dependent class is crowded into the smallest possible space.

ALREADY New York has covered about 8 of its 34 square miles with the dwellings of a population not far from 1,000,000, and all its commercial and manufacturing establishments. And the result is, as might have been anticipated, the dependent class, numbering fully one-half of the people, is crowded into tenant-houses which occupy an area of not more than two square miles. Such crowding amounts literally to packing.

Tenant-House Packing

For example, it is estimated that there are three contiguous blocks of tenant-houses which contain a larger population than Fifth Avenue; or, again, if Fifth Avenue had front and rear tenant-houses as densely packed as tenant-houses generally are, there would be a population of 100,000 on that single avenue. A single tenant-court in the Fourth Ward is arranged for the packing of 1,000 persons.



GOTHAM COURT, CHERRY STREET, 1865 — LONGITUDINAL ELEVATION

Arranged for the Packing of 1,000 Persons

SECTION OF CITY 240 BY 150 FEET, OCCUPIED BY 111 FAMILIES, AND BY STABLES, SOAP FACTORY, AND TANYARD

A resident of the same Ward reports that: "On a piece of ground 240 feet by 150, there are 20 tenant-houses, occupied by 111 families, 5 stables, a large soap and candle factory, and a tan-yard, the receptacle of green hides. The filth and stench of this locality are beyond any power of description." In general, it may be stated that the average number of families to a house among the poor is 7, or about 35 persons.

IT is necessary also to make a single explanation, to render more apparent the bearing of the facts developed. For the purposes of sanitary inquiry, the causes of disease are divided into those which are inevitable, and those which are avoidable or removable, and hence it follows that diseases and deaths are divided into those which are inevitable and those which are preventable. For example: Of unavoidable causes of disease, we have vicissitudes of weather, accidents, old age, physical degenerations, etc.

Avoidable and Inevitable Disease

Of avoidable or removable causes of disease we have those conditions around or within our dwellings or places of business or resort, errors in our mode of living, etc., which vitiate health, or rather tend to diseases, and yet which can be removed or changed by human agency. For

example, a country residence may be most favorably located for health, and yet decaying vegetable matter in the cellar, or a cesspool so situated as to allow the gaseous emanations to be diffused through the house, will expose all the inmates to fevers, diarrhœa and dysentery.

These would be preventable diseases, and all the deaths therefrom would be preventable, and hence unnecessary deaths. In like manner in cities, all diseases and deaths due to causes which human agencies can remove are preventable. And it is a melancholy fact that fifty per cent of the mortality of cities is estimated to be due to such causes, and is hence unnecessary.

In reviewing the result of this inspection, I shall call your attention only to the more patent causes of disease found existing, and to the preventable diseases discovered, and their relation to these causes. In this evidence you will find ample proof that radical reforms are required in the health organizations of New York.

Filthy Streets

I WILL first notice the causes of disease which exist external to our dwellings, and which are the most readily susceptible of remedy. The first that attracts attention in New York is the condition of the streets. No one can doubt that if the streets in a thickly populated part of a town are made the common receptacle of the refuse of families, that in its rapid decomposition a vast

amount of poisonous gases must escape, which will impregnate the entire district, penetrate the dwellings, and render the atmosphere in the neighborhood in a high degree injurious to the public health. In confirmation of this statement, I will quote the City Inspector, who, in a former communication to the Common Council, says:

"As an evidence of the effect of this state of things upon the health of the community, I would state that the mortality of the city, from the first of March, has been largely on the increase, until it has now reached a point of fearful magnitude. For the week ending April 27th, there were reported to this department one hundred and forty more deaths than occurred during the same week of the previous year. Were this increase of mortality the result of an existing pestilence or epidemic among us, the public would become justly alarmed as to the future; but although no actual pestilence, as such, exists, it is by no means certain that we are not preparing the way for some fatal scourge by the no longer to be endured filthy condition of our city."

The universal testimony of the sanitary inspectors is that in all portions of the city occupied by the poorer classes, the streets are in the same filthy condition as that described by the City Inspector, and, that street filth is one of the most fruitful causes of disease.

SAYS the Inspector of the Eighth Ward: "Laurens, Wooster, Clark, and Sullivan are in a most filthy condition, giving off insalubrious emanations on which depend the many cases of fever, cholera infantum, dysentery, and pulmonary diseases. I have observed that near where other streets cross the above-named streets there is a greater proportionate amount of sickness; and this fact I have shown by special reports of typhus and typhoid fever in Grand and Broome, and dysentery in Spring."

Street Filth and Disease

The Inspector of the Sixth Ward says: "Domestic garbage and filth of every kind is thrown into the streets, covering their surface, filling the gutters, obstructing the sewer culverts, and sending forth perennial emanations which must generate pestiferous disease. In winter the filth and garbage, etc., accumulate in the streets, to the depth sometimes of two or three feet. The garbage boxes are a perpetual source of nuisance in the streets, filth and offal being thrown all around them, pools of filthy water in many instances remaining in the gutters, and having their source in the garbage boxes."

The Inspector of the Seventh Ward says: "The whole most easterly portion of the district, the streets and gutters are very filthy with mud, ashes, garbage, etc."

The Inspector of the Thirteenth Ward says:

"The streets are generally in a filthy and unwholesome condition; especially in front of the tenant-houses, from which the garbage and slops are, to a great extent, thrown into the streets, where they putrefy, rendering the air offensive to the smell and deleterious to health. The refuse of the bedrooms of those sick with typhoid and scarlet fevers and smallpox is frequently thrown into the streets, there to contaminate the air, and, no doubt, aid in the spread of those pestilential diseases."

Says the Inspector of the Ninth Ward: "The effect of dirty streets upon the public health is too well known, and too often insisted upon, to need any exposition in this report. The largest number of cases of cholera infantum, cholera morbus, and kindred disease, is always found in localities where the streets are dirtiest."

The Inspector of the Seventeenth Ward writes: "The two following localities present the appearance of dung-hills rather than the thoroughfares in a civilized city, viz.: Sixth Street, between Bowery and Second Avenue, and Eleventh Street, between First and Second Avenues."

THE Inspector of the Eleventh Ward says: "As a rule, the streets are extremely dirty and offensive, and the gutters obstructed with filth. The filth of the streets is composed of house-slops, refuse vegetables, decayed fruit,

store and shop sweepings, ashes, dead animals, and even human excrements. These putrifying organic substances are ground together by the constantly passing vehicles. When dried by the summer's heat, they are driven by the wind in every direction in the form of dust. When remaining moist or liquid in the form of "slush," they emit deleterious and very offensive exhalations.. The reeking stench of the gutters, the street filth, and domestic garbage of this quarter of the city, constantly imperil the health of its inhabitants. It is a well-recognized cause of diarrhoeal diseases and fevers."

Animals Dead

The Inspector of the Eighteenth Ward reports: "The streets in the eastern part of the district, east of First Avenue especially, have, for the past six months, been in a most inexcusably filthy condition. The pavement here is uneven, there are deep gutters at either side of the streets, filled with foul slops, in which float or are sunk every form of decaying animal and vegetable matter. Occasionally, at remote and irregular intervals, carts come round, these stagnant pools are dredged, so to speak, and their black and decayed solid contents raked out. If there be anything on earth that is 'rank and smells to heaven,' these gutters do on such occasions, especially in the summer months. The streets in this part of the city are the principal depositories of garbage. In some instances

heaped up at the sides of the streets, in others thrown about promiscuously, the event in either case is the same, if it be allowed to remain day after day, as it usually is. After having passed through every stage of decay, after having corrupted the surrounding air with its pestilential smell, it gradually becomes dessicated and converted into dust by the summer sun and the constantly passing vehicles. And now every horse that passes stirs it up, every vehicle leaves a cloud of it behind; it is lifted into the air with every wind and carried in every direction.

"Those who are directly responsible for this state of things suffer no more than the cleanly and thrifty who are so unfortunate as to live anywhere the wind, blowing from this quarter, reaches them. And what a *pulvis compositum* is it to breathe into the lungs! As we pass by, our mouths become full of it, we draw it in with our breath. It is swallowed into the stomach, it penetrates our dress and clings until it has covered our perspiring skin. Surely no dumping-ground, no sewer, no vault, contains more filth or in greater variety than did the air in certain parts of our city during the long season of drought the past summer. And wherever the wind blows, the foul corruption is carried; by a process as sure and universal as the diffusion of gases, is it conveyed throughout the city. Such, often, is the air drawn into the lungs with every respiration,, of the poor sufferer stifled

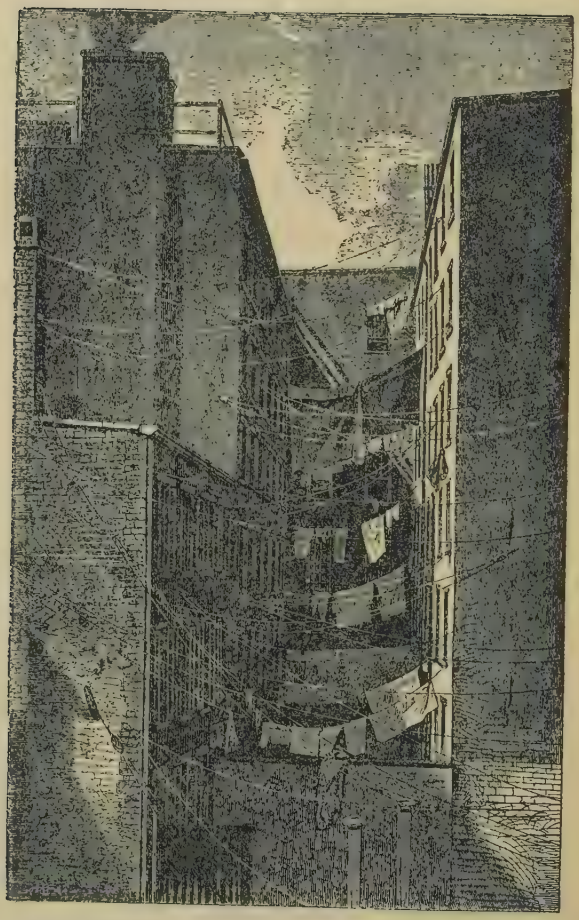
with consumption or burning with fever. No barrier can shut it out, no social distinction can save us from it; no domestic cleanliness, no private sanitary measures can substitute a pure atmosphere for a foul one."

But I need not multiply these quotations. It will suffice to state that during the week ending August 5th, a special inspection of all the streets was made and they were found to be reeking, and, indeed, almost impassable, with filth. And to-day they are in, if possible, a still worse condition than ever before.

Filthy Courts and Alleys

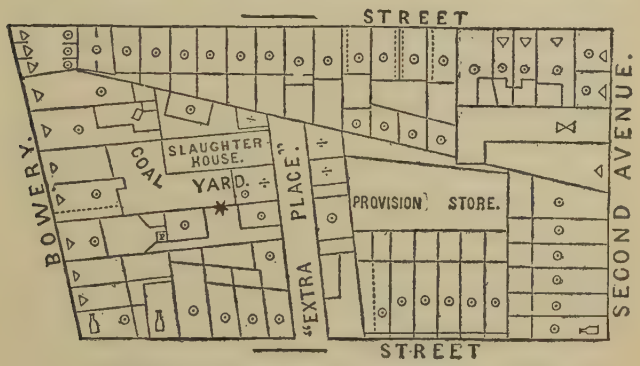
CLOSELY allied to the streets are courts and alleys. These cul-de-sacs leading to, and adjoining the close and unventilated homes of the poor, are almost universally in a more filthy condition than the adjacent street. They are the receptacles of much of the waste of the house, and are rarely cleaned. The air of these places during the summer is often the most stifling and irrespirable, and yet as it descends it enters the closely packed tenant-house and furnishes to the inmates the elements of disease and death. Says the Inspector of the Fourth Ward:

"Slops from rear buildings of such premises are usually emptied into a shallow gutter cut in the flagging and extending from the yard, or space between front and rear buildings, to the



A TENANT-HOUSE CUL-DE-SAC, PARK STREET, NEAR CITY HALL, WITH 307 INMATES; PHOTOGRAPHED FROM A HOUSE-TOP IN PEARL STREET, 1865

street. This is often clogged up by semi-fluid filth, so that the alley and those parts of the yard through which it runs are not infrequently overflown and submerged to the depth of several inches. There are more than four hundred families in this district whose homes can only be reached by wading through a disgusting deposit of filthy refuse. In some instances, a stag-



A CUL-DE-SAC, SHOWING OVERCROWDING, NEAR SLAUGHTER-HOUSE AND STABLES

New York, 1865

ing of plank, elevated a few inches above the surface, is constructed through the alleys."

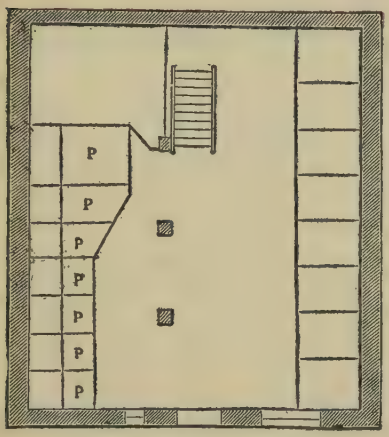
IN the court is found generally that most pestiferous of all the sources of civic uncleanliness and unhealthiness — the privy and cesspool. These receptacles are rarely drained into the sewers, and consequently require for

their cleanliness the frequent and faithful attention of the scavenger. The reports of the sanitary inspectors prove that this work is most irregularly and imperfectly done. Hundreds of places were found where these nuisances existed within, under or beside large tenant-houses, creating a vast amount of disease and death. Numerous instances of this kind are detailed in these reports, which are almost too revolting to be believed. I will quote but one or two illustrations:

Cesspool Abominations

"The privies (two in one) of Nos. — and — West Twenty-fourth Street need instant cleaning. They are overflowing the yard, and are very offensive. The privy No. — Seventh Avenue, as in the preceding two adjoining houses, is in the yard, and adjoins the house, and is on a line with the southerly wall of house No. — (the adjacent house), which has a back area; the wall of said area being part of the foundation of the privy. At times the fluid portion of the privy oozes through its own and the area wall.

"The privy of the rear tenant-house No. — West Twenty-second Street is used by 42 persons; it has five subdivisions, one for every two families. The compartments are so small that a person can scarcely turn round in them, and so dark that they have to be entered with an artificial light. The cellar itself, as has been



PLAN OF CELLAR

stated, is damp, dark, and without ventilation. Under such circumstances the emanations of the excrementious matter of 42 persons can find no escape; thus this privy-cellar is worse than a Stygian pit."

The Inspector of the Fifth Ward says: "Very few tenements have water-closets in the house; they have privies in the yards, which, as a rule, are insufficient for the accommodation of the numbers crowded into the houses; many are not connected with the sewers; are seldom cleaned, being allowed to overflow in some cases, rendering the neighborhood offensive with insalubrious emanations."

The Inspector of the Fourteenth Ward states that: "The water-closets are nearly all in the yards — but few being in the houses — and connecting with the sewers. The greater number of these sewers are in a filthy condition, being but seldom emptied. Many of those which communicate with the privies are choked

up by all sorts of offal being thrown into them, thereby producing a very bad condition."

THE Inspector of the Seventeenth Ward reports: "The privies of East Eleventh Street, rear, are beneath the floored alley-way leading to the building. Large holes in this floor allow ocular inspection from above, and admit rain and dirt. These nuisances are almost always overflowing, and the passage leading to them is full of fæcal matter. It would seem impossible for human beings to create or endure such vileness. The cellar is used by children and others as a privy; the foul air there seems never to change."

Unbelievable Vileness

The Inspector of the Sixteenth Ward says: "The privies form one end of the chief features of insalubrity. Nearly all of them are too small in size and too few in number, and without ventilation or seat-covers. About twelve were found locked securely, and on procuring the key and inspecting the privy, such masses of human excrements were found on the seats and floors as would justify the locking of the door to protect unwary persons from injury. Occupants of rear buildings are the principal sufferers from this insalubrity. The proximity of privies is in some cases eight feet from the windows of rear houses; the odor in these is, especially at night, intolerable. Instances of the kind are to

be found at Nos. —, — and — West Seventeenth Street, and others. They are also too few in number; for example, No. — West Nineteenth Street, where in the front and rear buildings more than one hundred persons live who have one common privy, with a single partition dividing it, and but four seats in all. Twenty-five persons are expected to use one seat-opening."

The Inspector of the Twentieth Ward says: "During my inspection I reported a number which were filled, and at the same time in such need of repair as to hazard the lives of those who entered them. The proximity of these places to the houses in many cases is a fact to which I would call your attention. One instance of this kind I may state: At a house in Fortieth Street, between Broadway and Seventh Avenue, the privy is situated about 10 feet from the door, and there is another on a line 10 feet from the first, and still another within 10 feet of the last mentioned, making three privies within 30 feet, and two of these belong to houses fronting on Broadway. The offensive odor arising from these places contaminates the air of the houses in the vicinity. This house, in Fortieth Street, is actually unfit to live in. At the time of my inspection the noxious gases from these privies were strongly perceptible in every part of the house."

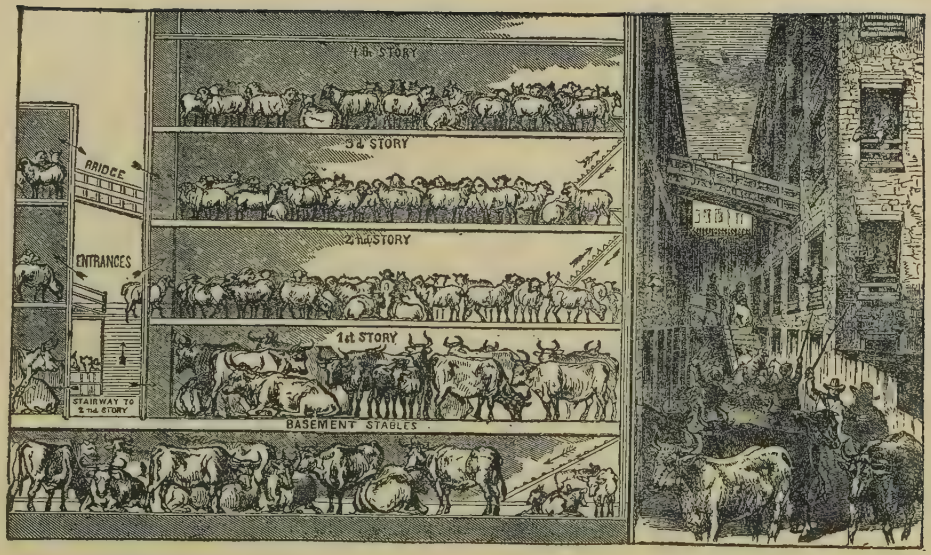
The Inspector of the Seventeenth Ward reports: "The privies are in most cases in the rear

court-yard. In about two-thirds of the houses the privies are connected with the sewer. Overflowing privies are frequently found. Sometimes they are located in a dark place, which in all cases must be considered an evil. Such is the case in some houses in Rivington, Stanton, Ninth and Eldridge streets. All these places are filthy, and exceedingly offensive and dangerous to the whole neighborhood; in some places the foundation of the privies being rotten and broken, and fæcal matter runs into the cellar, as in No. — 'Extra Place,' where diseases and deaths have occurred. The contents of a privy in a court at No. — Fifth Street have, from a similar cause, saturated the yard of premises on the Bowery, where several children died during the summer."

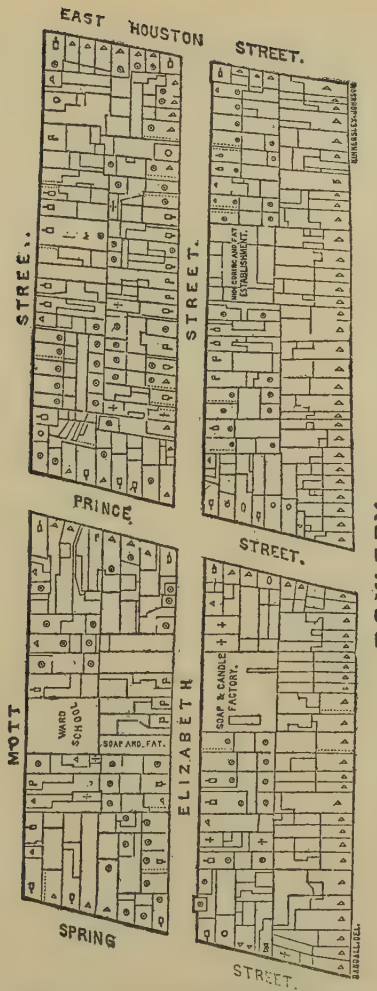
Special Nuisances

I WILL at this point simply allude to special nuisances. New York has within the narrow limits of its present occupied area of about eight square miles, in addition to its one million of people, and all its commercial and manufacturing establishments, a vast number of special nuisances, which are, to a greater or less degree, detrimental to its public health. There are nearly 200 slaughter-houses, many of which are in the most densely populated districts. To these places droves of cattle, hogs, and sheep are constantly driven, rendering the

SLAUGHTER-PENS IN REAR OF TENANT-HOUSES IN THE ELEVENTH WARD, 1865



SIXTH STREET CATTLE MARKET, 1865



REGION OF HIDE-CURING, FAT-GATHERING, FAT AND SOAP BOILING, AND SLAUGHTER-PENS, BEHIND THE BOWERY SHOPPING HOUSES, 1865

REGION OF BONE-BOILING AND SWILL-MILK NUISANCES, 1865

streets filthy in the extreme, and from them flow blood and refuse of the most disgusting character.

In certain populous sections are fat-boiling, entrails-cleansing, and tripe-curing establishments, which poison the air for squares around with their stifling emanations. To these must be added hundreds of uncleaned stables, immense manure heaps, etc., etc. But I shall not dwell further on these subjects, and the evidence regarding them.

Cellar Population — Dens of Death

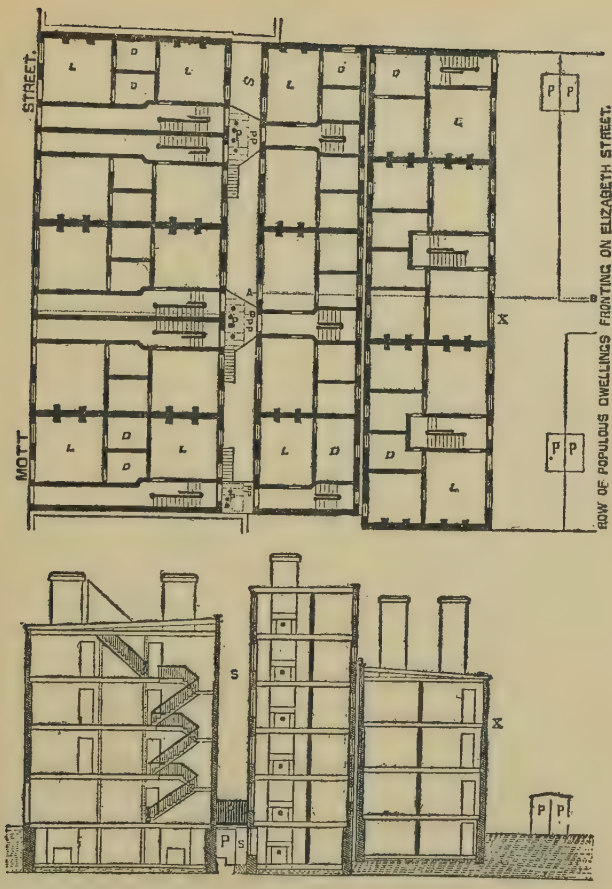
I PASS from the consideration of the external to the internal domiciliary conditions. The poorer classes of New York are found living either in cellars or in tenement houses. It is estimated by the City Inspector that 18,000 persons live in cellars. This is also about the estimate of the police. The apartments of these people are not the light and airy basement rooms of the better class houses, but their homes are, in the worst sense, cellars. These dark, damp and dreary abodes are seldom penetrated by a ray of sunlight, or enlivened by a breath of fresh air. I will quote several descriptions from these reports. In the Fourth Ward many of these cellars are below tide water. Says the Inspector of that district:

"This submarine region is not only excessively

damp, but is liable to sudden inroads from the sea. At high tide the water often wells up through the floors, submerging them to a considerable depth. In very many cases the vaults of privies are situated on the same or a higher level, and their contents frequently ooze through the walls into the occupied apartments beside them. Fully one-fourth of these subterranean domiciles are pervaded by a most offensive odor from this source, and rendered exceedingly unwholesome as human habitations. These are the places in which we most frequently meet with typhoid fever and dysentery during the summer months. I estimate the amount of sickness of all kinds affecting the residents of basements and cellars, compared with that occurring among an equal number of the inhabitants of floors above ground, as being about a ratio of 3 to 2."

The Inspector of the Fifteenth Ward reports: "In a dark and damp cellar, about 18 feet square and 7 feet high, lived a family of seven persons; within the past year two have died of typhus, two of smallpox, and one has been sent to the hospital with erysipelas. The tops of the windows of this abode are below the level of the surface, and in the court near are several privies and a rear tenant-house. Yet this occurred but a short distance from the very heart of the city."

The Inspector of the Ninth Ward writes: "At Nos. —, —, — and — Hammond Street, and also



TRANSVERSE SECTIONAL VIEW OF ROOKERY BETWEEN BROADWAY AND BOWERY, 1865

In its dark, damp cellar, 18 feet square by 7 high, lived 7 persons

L, Living Room; D, Dormitory

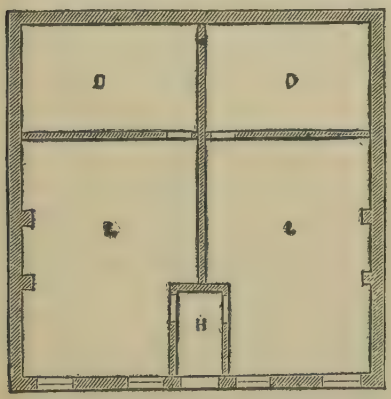
at No. — Washington Street, are inhabited cellars, the ceilings of which are below the level of the street, inaccessible to the rays of the sun, and always damp and dismal. Three of them are flooded at every heavy rain, and require to be baled out. They are let at a somewhat smaller rent than is asked for apartments on an upper floor, and are rented by those to whom poverty leaves no choice. They are rarely vacant."

The Inspector of the Seventeenth Ward states that: "In 17 squares 55 houses contain 246 persons living in cellars entirely underground. As a matter of course such cellars are unhealthy dwelling apartments. Stanton Place has some of these miserable cellar-apartments, in which diseases have been generated. These cellars are entirely subterranean, dark and damp."

THE Inspector of the Sixth Ward says: "There has been some improvement within the last few years — the cellar population having been perceptibly decreased, yet 496 persons still live in damp and unwholesome quarters under ground. In some of them water was discovered trickling down the walls, the source of which was sometimes traced to the courts and alleys, and sometimes to the soakage from the water-closets. The noxious effluvia always present in these

496 Persons Under Ground

basements are of a sickening character. Many of the cellars are occupied by two or three families; a number are also occupied as lodging-houses, accommodating from twenty to thirty lodgers. One, near the corner of Elm and Worth streets, is now fifteen or sixteen feet below the level of the street (the street having been raised ten feet). The lodging-house keeper complained to the Inspector that her business had fallen off some since the street was raised. As might be expected, the sickness rate is very high; rheumatic disease, fevers, strumous diseases, cholera infantum, etc., etc., running riot among the population. Indeed, in nearly every basement disease of some kind has been found peculiarly prevalent and fatal."



PLAN OF CELLAR IN THE SIXTEENTH WARD, 1865, OCCUPIED BY TWO FAMILIES, EACH WITH A DARK LIVING-ROOM, AND A DARK, DAMP DORMITORY

Another Inspector says: "At No. — West Sixteenth Street, two families, in which are thirteen persons, occupy the basement. It is so dark that ordinary type can be seen with difficulty. In the other case the peo-

ple were healthy before entering the basement; since, however, they have been ill; the mother has phthisis. Of twenty-four cellars, note of which has been made, four only were in good sanitary condition. The rest were more or less filthy, some indescribably so. One contained urine, bones, and soakage from the privy."

The Inspector of the Eighteenth Ward writes: "There are a few cellars so dark that one cannot see to read in them, unless by artificial light, except for a few hours in the day, by sitting close to the window; and there are many basement rooms into whose gloomy recesses not a single direct ray from the sun ever shone. The latter are, as a rule, by half their depth below the level of the street. Dark and damp, with very little chance for circulation of air, it would be difficult to imagine a human being more completely beyond reach of sanitary provisions. And when we consider that four large families often crowd this subterranean floor, no words are needed to show their condition deplorable. That a generally impaired vitality is promoted by living in this unnatural way, 'a nameless, ever new disease,' there can be no question; that these people will be especially prone to whatever form of prevailing sickness may be about in the community, no one can doubt; but whether there is any specific cause involved, capable of producing definite forms of disease, is more difficult to determine."

AN Inspector thus describes a visit to one of these subterranean abodes: "We enter a room whose low ceiling is blackened with smoke, and its walls discolored with damp. In front, opening on a narrow area covered with green mould, two small windows, their tops scarcely level with the court-yard, afford at noonday a twilight illumination to the apartment. Through their broken panes they admit the damp air laden with effluvia, which constitutes the vital atmosphere inhaled by all who are immured in this dismal abode. A door at the back of this room communicates with another which is entirely dark, and has but this one opening. Both rooms together have an area of about eighteen feet square.

A Visit to the Cave-Dwellers

"The father of the family, a day laborer, is absent. The mother, a wrinkled crone at thirty, sits rocking in her arms an infant whose pasty and pallid features tell that decay and death are usurping the place of health and life. Two older children are in the street, which is their only playground, and the only place where they can go to breathe an atmosphere that is even comparatively pure. A fourth child, emaciated to a skeleton, and with that ghastly and unearthly look which marasmus impresses on its victims, has reared his feeble frame on a rickety chair against the window sill, and is striving to get a glimpse of the smiling heavens, whose

light is so seldom permitted to gladden its longing eyes. Its youth has battled nobly against the terrible morbid and devitalizing agents which have oppressed its childish life — the poisonous air, the darkness, and the damp; but the battle is nearly over — it is easy to decide where the victory will be."

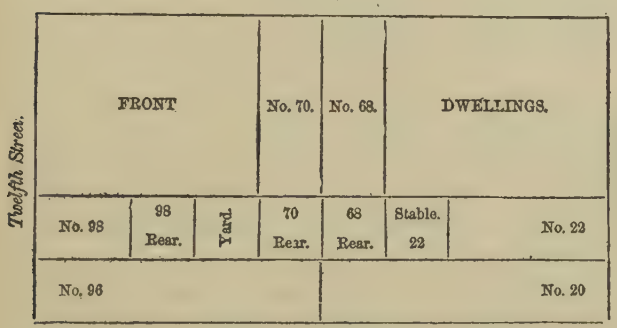
But I need not multiply the evidences that 18,000 people, men, women, and children (a goodly-sized town), are to-day living in our city in a condition the most destructive to health, happiness, and morals that could possibly be devised. As you look into these abodes of wretchedness, filth and disease, the inmates manifest the same lethargic habits as animals, burrowing in the ground. They are, indeed, half narcotized by the constant inhalation of the emanations of their own bodies, and by a prolonged absence of light and fresh air. Here we never find sound health, while the constant sickness rate ranges from 75 to 90 per cent.

Tenant-House Population

NOW, as to the second condition under which we find the laboring classes. It is estimated by the police that the tenant-house population of New York reaches the enormous figure of 500,000 or about half of the total number of inhabitants. The great and striking fact in regard to the domiciliary condition of the tenant-house class is over-

crowding and deficient sunlight and fresh air. The landlord of the poor tenant-house has two principal motives — first, to pack as many people as he can in a given space, and second, to make as few improvements and repairs as possible.

The tenant-houses are of two classes, viz., the front and the rear. The latter is closely



PLAN SHOWING REAR TENANT-HOUSES, NEAR A STABLE, IN THE SEVENTEENTH WARD, 1865

allied to the cellar; being shut out from air and sunlight, it is generally damp, gloomy, and filthy. The space between the front and rear house, familiarly called the "well hole," contains the privy and cesspool, the emanations from which are closely confined to this space, and slowly but constantly prevade with their disgusting odors all the rooms and recesses.

The tenant-house has frequently been de-

scribed by sensation writers, with all its miseries, its diseases and its deaths. But no pen nor pencil can sketch the living reality. It is only by personal inspection that one can learn to what depths of social and physical degradation human beings can descend. Said a committee appointed by your body to investigate the condition of the tenant-houses of New York:

"Sitting together upon the same broken box, lying together upon the same dirty straw, covered by the same filthy shreds, vieing with each other in the utterance of foul obscenities, you have a picture of the mass of corruption and squalid misery gathered inside the walls of that unventilated building in Mission Place. In that single house there was that which made the soul sicken and turn in horror from the sight. Vice, with its pretentious brow, and wretchedness, with hollow cheek and sunken, glazed eye, were there; hunger and lust stood side by side, petit larceny and cold-blooded murder were holding converse."

THE inspectors describe more or less minutely a large number of tenant-houses, and also of groups:

"'Cat Alley' is the local designation of a group of dilapidated tenant-houses in an alley on Cannon Street. The alley is unpaved, and is excessively filthy. The privy is a small and broken-down structure, covering only a part of

the vault, which is now full almost to overflowing. The inhabitants are degraded, both physically and socially. In several of the domiciles, at the time of our last inspection, there was neither bedstead nor table. Twelve of these families were found in a wretched condition, and all the children we saw were covered with dirt, and presented the intensest aspects of scrofulous disease; their sore eyes, encrusted heads, and dehumanizing appearance, told the story of want and neglect, and of greater evils to come.

Cat Alley

"Five small houses, two and a half stories in height, including the basements, each containing apartments for six families, front on an alley called Rivington Place. This alley is always in a filthy condition. The houses on it are small and overcrowded. The 30 families that reside in these five houses have no other water supply than that which two hydrants furnish in the exterior courtyard; while for this population of nearly 200 persons, of all ages, there are but two privy vaults, and, at the time of the last inspection of the quarters, these vaults were filled nearly to the surface. In the year 1849, 42 individuals died here in three weeks of cholera, and not one recovered that was taken sick. The reasons are plain: they have no ventilation, and the houses being double, the exhalations from one apartment are inhaled by the other.

"At No. — West Twenty-fifth Street, a

THE FILTHY ALLEY CALLED RIVINGTON PLACE, 1865, IN THE REAR OF NUMBERS 316 AND 318 RIVINGTON STREET

wretched tenement of two apartments, the rooms occupied by one familty. The sitting-room is about 10x12 feet, and the bedroom about 5x12, without a single window or air hole. These rooms were occupied in the hot month of July by a colored female, having pulmonary consumption, and her two children. Here she died, shortly after we made the inspection of her domicilium; having no money nor friends, a Christian burial was denied her for four days, although the neighbors acquainted the police of the fact, and they the Health Warden."

Rag Pickers Row

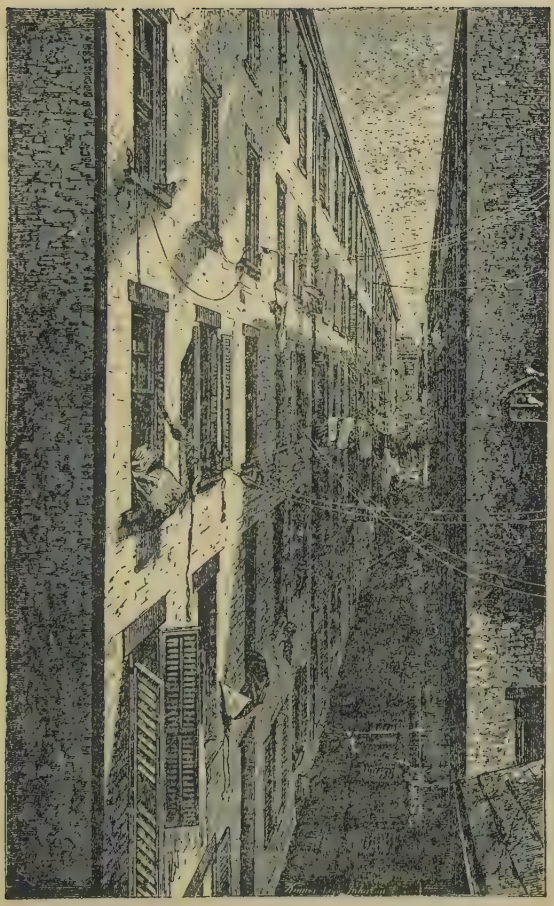
"RAG PICKERS ROW" is thus described: "The houses are of wood, two stories, with attic and basement. The attic rooms are used to deposit the filthy rags and bones as they are taken from gutters and slaughter-houses. The yards are filled with dirty rags hung up to dry, sending forth their stench to all the neighborhood, and are exceedingly nauseous, operating upon me as an emetic. The tenants are all Germans of the lowest order, having no national nor personal pride; they are exceedingly filthy in person, and their bed-clothes are as dirty as the floors they walk on; their food is of the poorest quality, and their feet and heads, and doubtless their whole bodies, are anasarcous, suffering from what they call rheumatism, but which is in reality a

prostrate nervous system, the result of foul air air and inadequate supply of nutritious food. They have a peculiar taste for the association of dogs and cats, there being about 50 of the former and 30 of the latter. The whole number of apartments is 32, occupied by 28 families, number 120 in all, 60 adults and 60 children. The yards are all small, and the sinks running over with filth."

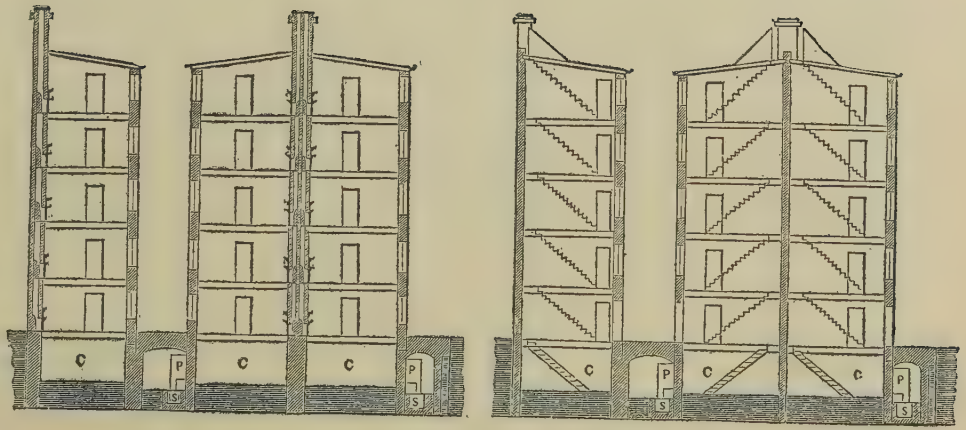
Tenant-House Degeneration

SAYS a visitor in the Eighth Ward: "The instances are many in which one or more families, of from three to seven or more members, of all ages and both sexes, are congregated in a single and often contracted apartment. Here they eat, drink, sleep, work, dress and undress, without the possibility of that privacy which an innate modesty imperatively demands. In sickness and in health it is the same.

"What is the consequence? The sense of shame — the greatest, surest safeguard of virtue, except the grace of God — is gradually blunted, ruined, and finally destroyed. New scenes are witnessed and participated in, with a countenance of brass, the very thought of which, once, would have filled the sensitive heart of modesty with pain, ad covered its cheek with burning blushes. The mind of one thus brought in daily and nightly contact with such



GOTHAM COURT, ON CHERRY STREET, 1865



TRANSVERSE SECTIONAL ELEVATION OF THE GOTHAM COURT ROOKERY
C, Cellar; P, Privy; S, Sewer

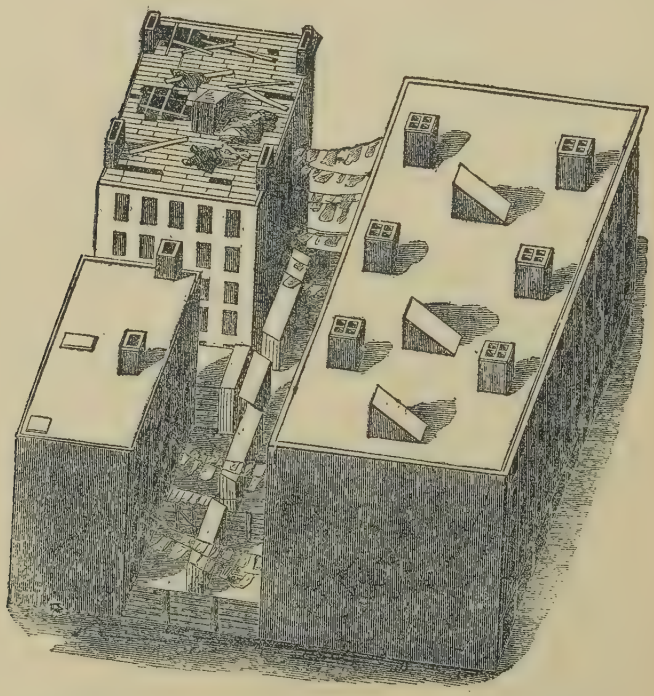
scenes must become greatly debased, and its fall, before the assaults of vice, rendered almost certain."

Another writes: "These houses seem to be always open to newcomers, and, in some way or other, they can accommodate them. I have found three families, of men, women, and children, in one room; there they lived and there they slept. Can any one doubt that there must be a rapid declension of morals in both parents and children, or that a bar is here opposed to moral and religious instruction, or that this state of things is consequent on the circumstances and condition of life?"

I could give you many details of other tenant-houses, the reputation of which is a reproach to any city in the civilized world. Such is "Gotham Court," "Rotten Row," "The Great Eastern," "Sebastopol," "Quality Row," "Bummer's Retreat," etc. Speaking of the tenant-house, the Rev. Dr. Muhlenburg says:

"'Their homes!' that cold and damp cellar, about as tenantable as your coal vault! Do you call that a home for the distressed body, crowded in one corner there, swollen with the pains of rheumatism? Or that close apartment, heated or stifling in preparing the evening meal, on the shattered stove — that suffocating room, where you would not stop within for a moment — is that the home which you think so favorable for the worn asthmatic, catching every

breath as if the last? Ask any clergyman, he will tell you with how little satisfaction he makes his visits among the poor, when they are laboring among disease; how he never has the



"THE GREAT EASTERN," NUMBER 115 EAST 37TH STREET, 1865

heart to speak of comfort for the soul, when discomforts of the body call so loudly for re-

lief, and for which the scanty aid he can minister seems akin to mockery!"

The Rioters

MR. N. P. WILLIS who witnessed the "draft" riots thus truthfully and graphically describes the inmates of tenant-houses:

"The high brick blocks and closely packed houses where the mobs originated, seemed to be literally hives of sickness and vice. It was wonderful to see, and difficult to believe, that so much misery, disease and wretchedness can be huddled together and hidden by high walls, unvisited and unthought of, so near our own abodes. Lewd, but pale and sickly young women, scarce decent in their ragged attire, were impudent and scattered everywhere in the crowd. But what numbers of these poorer classes are deformed — what numbers are made hideous by self-neglect and infirmity! Alas! human faces look so hideous with hope and self-respect all gone! And female forms and features are made so frightful by sin, squalor, and debasement! To walk the streets as we walked them, in those hours of conflagration and riot, was like witnessing the day of judgment, with every wicked thing revealed, every sin and sorrow blazingly glared upon, every hidden abomation laid bare before hell's expectant fire? The elements of popular discord are gathered in these wretchedly constructed tenement houses, where pov-

erty, disease, and crime find an abode. Here disease in its most loathsome forms propagates itself. Unholy passions rule in the domestic circle. Everything, within and without, tends to physical and moral degradation."

SUCH, Mr. Chairman, is the external and internal sanitary condition of the homes of 500,000 people in the City of New York today, as revealed by this inspection. It requires no extraordinary amount of medical knowledge to determine the physical condition of this immense population, living under such circumstances. Even though no devastating epidemic is found ravaging the tenant-house, yet the first sight of the wretched inmates convinces you that diseases far more destructive to health and happiness, because creating no alarm, are wasting the vital energies, and slowly but surely consuming the very tissues of the body.

Tenant-House Rot

Here infantile life unfolds its bud, but perishes before its first anniversary. Here youth is ugly with loathsome diseases and the deformities which follow physical degeneracy. Here the decrepitude of old age is found at thirty. The poor themselves have a very expressive term for the slow process of decay which they suffer, viz.: "Tenant-house Rot." The great majority are, indeed, undergoing a

slow decomposition — a true eremacausis, as the chemists term it. And with this physical degeneration we find mental and moral deterioration. The frequent expression of the poor, "We have no sickness, thank God," is uttered by those whose sunken eyes, pale cheeks, and colorless lips speak more eloquently than words, of the unseen agencies which are sapping the fountains of health. Vice, crime, drunkenness, lust, disease, and death, here hold sway, in spite of the most powerful moral and religious influences.

Religious teachers and Bible readers are beginning to give this class over, as past all remedy, until their physical condition is improved. Their intellects are so blunted and their perceptions so perverted by the noxious atmosphere which they breathe, and the all-pervading filth in which they live, move, and have their being, that they are not susceptible to moral or religious influences. In London, some of the city missionaries have entirely abandoned the tenant-house class. There is, undoubtedly, a depraved physical condition which explains the moral deterioration of these people, and which can never be overcome until we surround them with the conditions of sound health. A child growing up in this pestilential atmosphere becomes vicious and brutal, not from any natural depravity, but because it is mentally incapable of the perceptions of truth.

Most truly does the Inspector of the Fourth Ward say:

"THERE is a tenant-house cachexy well-known to such medical men as have a practical acquaintance with these abodes; nor does it affect alone the physical condition of their inmates. It has its moral prototype in an ochlesis of vice — a contagious depravity, to whose malign influence the youthful survivors of the terrible physical evils to which their infancy is exposed, are sure to succumb. We often find in persons of less than middle age, who have long occupied such confined and filthy premises, a morbid condition of the system unknown elsewhere. The eye becomes bleared, the senses blunted, the limbs shrunken and tremulous, the secretions excedingly offensive. There is a state of premature decay.

Tenant-House Cachexy

"In this condition of life the ties of nature seem to be unloosed. Maternal instinct and filial affection seem to participate in the general decay of soul and body. A kind Providence, whose hand is visible even here, mercifully provides that the almost inevitable decay and death which man's criminal neglect entails on the offspring of the unfortunate who dwell in these dreary mansions, shall elicit comparatively feeble pangs of parental anguish. To the phys-

ical and moral degradation, the blight of these miserable abodes, where decay reigns supreme over habitation and inhabitant alike, may be plainly traced much of the immorality and crime which prevail among us. The established truth, that, as the corporeal frame deteriorates, man's spiritual nature is liable also to degenerate, receives its apt illustration here."

BUT, sir, acute diseases, and those frequently of the most destructive character, prevail at all seasons among the tenant-house population, and generally with fearful fatality. Although the last summer and autumn were unusually healthy, these records show the prevalence of a vast amount of diseases among the poor of New York. These diseases are of a kind that always originate in or are aggravated by the crowding of families in unventilated apartments, want of sunlight and pure air, house and street filth, etc.

Prevailing Diseases

First Ward: The diseases prevalent in this district the past season have been principally typhus, measles, diarrhoea, dysentery, cholera morbus, cholera infantum, and marasmus. Diarrhoeal diseases are most prevalent in those insalubrious quarters already described, and at a season when the exciting causes are at their greatest stage of development and activity.

Second and Third Wards: Typhus fever made

its appearance in tenant-houses, and in two or three instances spread through all the families immediately exposed. At one place the disease attacked successively every member of the family immediately exposed, but was prevented from spreading further by free ventilation.

Fifth Ward: The slips, in consequence of receiving the sewerage of the district and surrounding parts of the city, are generally foul and the undoubted source of much sickness. Smallpox has prevailed more extensively than for many years back. Typhus and typhoid fevers have been prevalent over the whole district.

Eighth Ward: The prevailing diseases of the past season have been fevers of the typhus, typhoid, remittent and intermittent types, cholera infantum, scarlatina, dysentery, and diarrhoea, all confined to densely populated tenements. The typhus and typhoid fevers have been of a malignant type in two houses, twelve out of eighteen cases proving fatal.

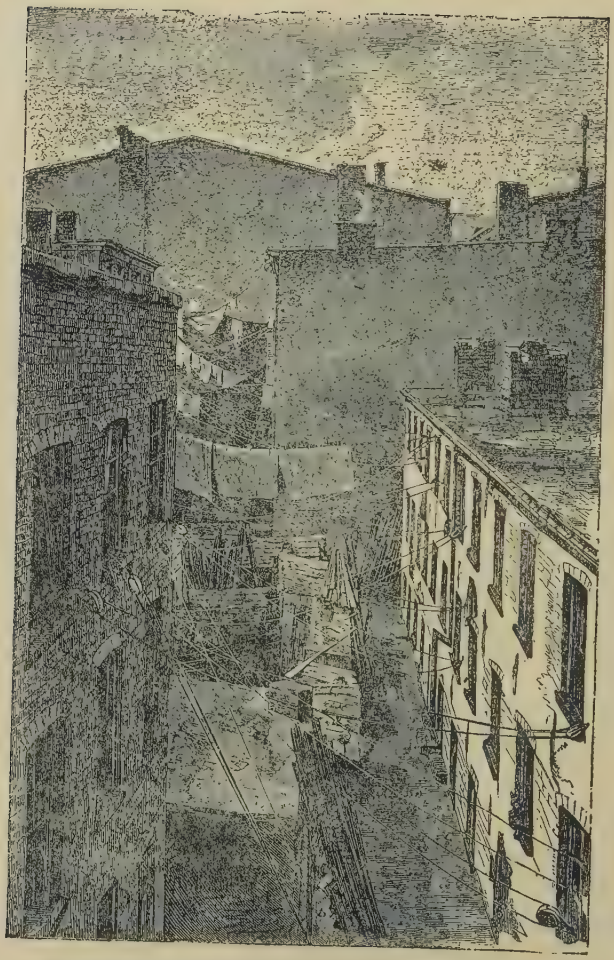
Ninth Ward: The prevailing diseases during the past season have been typhoid fever, dysentery, diarrhoea, scarlet fever, measles, and a few cases of variola.

SIXTH Ward: The seeds of disease exist everywhere, and although removable and susceptible of sanitary control, they are yet uncontrolled, and at any time may spring into activity and a terrific life, that shall only have

the power and effect of death. Cholera, when it visits these shores again, will first break forth here, if proper sanitary measures be neglected. Typhus fever nests exist in all parts of the district; and it has been traced from these nests to every ward in the city, spreading the disease not only in the worst localities, but into the homes of the industrious, the wealthy, and the highest classes of society. This disease is now on the increase, and if proper sanitary measures are not adopted to remove the predisposing and the infecting causes, we may again have an epidemic of that scourge.

Seeds of Disease Uncontrolled

Fourteenth Ward: There have been attended in this district, during the last year, over 200 cases of typhoid and typhus fever by one dispensary physician; also, 70 cases of dysentery, and 50 cases of smallpox. There is one particular locality which has contributed to the spread and intensity of the fever contagion, viz.: the little street known as Jersey Street. It is always filthy, and the effluvia arising therefrom is extremely offensive. The privies are generally full nearly to overflowing, and the yards are also in a dirty condition, heaps of refuse matter being allowed to remain and to accumulate continually in many of them. There is no sewer in this little street, though the streets at each end are sewered.



A PERPETUAL FEVER-NEST: REAR TENANT-HOUSES IN WASHINGTON STREET, 1865

TENTH WARD: The most prominent diseases during the past year have been phthisis, typhoid and scarlet fevers, cholera infantum, dysentery, smallpox, and diphtheria. They were most prevalent in the poorest part of the district, having the lowest ground, the filthiest streets, and the most dense population of poor and careless people, who are crowded in the numerous tenant-houses, shanties, and small dwellings, which were built for one or two families, but are now made to contain from five to ten.

Where Disease Flourishes

Nineteenth Ward: The diseases that have chiefly prevailed during the past season are dysentery, diarrhoea, cholera morbus, cholera infantum and the exanthematous fevers. They were of the most frequent occurrence in the most crowded and insalubrious quarters.

Fifteenth Ward: Since the commencement of the survey, scarlet fever, typhoid fever, smallpox, and cholera infantum have prevailed in the tenant-houses of this ward. Six cases of smallpox occurred in one of three thickly peopled rows of such dwellings, and the disease was communicated to a child in an adjacent street, who had been playing in the infected neighborhood. Seven cases of typhoid also occurred in a court among children, and this was within a few doors of better class houses.

Eleventh Ward: Typhus and typhoid fevers

have been found prevailing in all sections of this district. Smallpox, scarlatina, measles, and pulmonary diseases are met with in almost every street. Typhus is the most typical of the preventable diseases that abound in the Eleventh Ward. Cholera infantum and obstinate diarrhoeal maladies were prevalent in the rear tenements and throughout the lowest streets during the summer and autumn.

To give you an idea of the wide prevalence of these diseases, I will notice one or two more in detail.

Smallpox

SMALLPOX is the very type of preventable diseases. We have a safe and sure preventive in thorough vaccination. And yet this loathsome disease is at this moment an epidemic in New York. In two days' time, the inspectors found 644 cases, and in two weeks, upward of 1,200; and it was estimated that only about one-half were discovered. In many large tenant-houses, six, eight, and ten cases were found at the same time. They found it under every conceivable condition tending to promote its communicability. It was in the street cars, in the stages, in the hacks, on the ferry-boats, in junk-shops, in cigar-stores, in candy-shops, in the families of tailors and seamstresses, who were making clothing for wholesale stores, in public and in private charities. I hold in my hand a list

of cases of smallpox found existing under circumstances which show how widespread is this disease. Bedding of a fatal case of smallpox was sold to a rag-man; case in a room where candy and daily papers were sold; case on a ferry-boat; woman was attending bar and acting as nurse to her husband who had smallpox; girl was making cigars while scabs were falling from her skin; seamstress was making shirts for a Broadway store, one of which was thrown over the cradle of a child sick of smallpox; tailors making soldiers' clothing, have their children, from whom the scabs were falling, wrapped in the garments; a woman selling vegetables had the scabs falling from her face, among the vegetables, etc., etc. Instances of this kind can be quoted at any length, but these examples are sufficient to show that smallpox spreads uncontrolled throughout our city. And they show, too, how this disease is disseminated abroad. Says the Inspector of the Fourth Ward:

"IN localities where smallpox prevailed I found, in some instances within a few feet of the patients, tailors at work for our best clothing establishments. Such infected vestments — worse than the tunic of the Centaur — bring disease and death not only to the wearers, but to many others. The occupant of the crowded tenant-house procures from such a

source a coat or a blanket, and soon a loathsome pest attacks the young and unprotected members of his family, and ultimately spreads through the entire quarter, destroying life after life and endangering the health of a whole community.

Smallpox in Tailored Garments

"Smallpox, suddenly breaking out in some secluded rural district, often owes its unsuspected origin to the above causes. In the remote solitude of the ocean the seaman opens the chest in which he has deposited such obnoxious apparel, and from this Pandora's box scatters the seeds of pestilence among his comrades, which, ripening, shall spread its germs to distant ports."

Or, what is more striking, take the following from the report of the Inspector of the Fifth Ward:

"The largest wholesale establishments for the sale of dry goods on this side of the Atlantic Ocean are in immediate contact with the tenant-houses of the worst class, and which are infested with smallpox and typhus fever. The two freight depots and the principal passenger depot of the Railroad Company are in the same close association with these nests of infection. In the region immediately surrounding are also situated several hotels, and a large number of boarding-houses, whose inmates are thus in dan-

A REGION OF SMALLPOX AND TYPHUS FEVER, 1865

ger of personal contact with these diseases any moment. West Broadway, running through the very centre of the district, is traversed by five different lines of railway cars, with an average of five cars passing every minute, and carrying millions of passengers yearly by the very doors of these houses. Broadway, at but a short distance removed, is the principal thoroughfare of the city. Hudson Street on the west is also a leading route for city travel; and the cross streets of the district are traversed daily by multitudes to reach various lines of steamboats, cars, and steamships, which leave the city opposite this point.

"All this large amount of daily travel passes through a region always containing cases of typhus fever, and largely infected with smallpox. Is it any cause of surprise that cases of these diseases are here contracted, to be carried to distant sections of the country, there to develop themselves, to the surprise and alarm of whole neighborhoods? It is also well to remember that several large livery stables are located in the immediate neighborhood, whose vehicles, it is well-known, are frequently employed to carry persons, suffering from these diseases, to hospitals, or to attend at funerals. These vehicles are, perhaps, immediately afterward driven to the various car and steamboat lines to secure passengers, who are thus exposed in the most dangerous manner to these diseases."

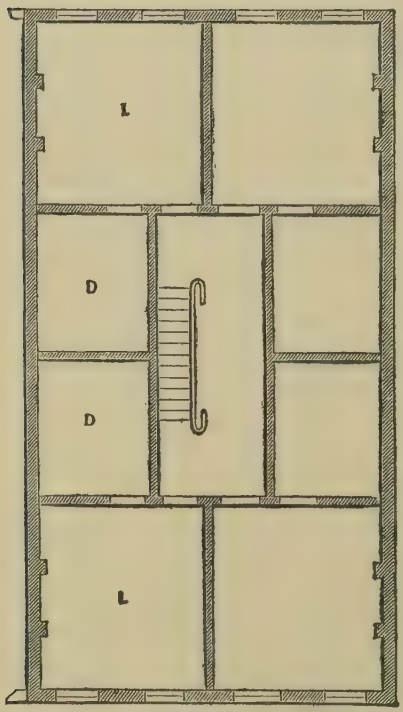
SECOND only to smallpox as a preventable disease, but of a more fatal character, is typhus fever. Typhus is greatly aggravated by domestic filth, and by overcrowding, with deficient ventilation. The inspectors found and located by street and number no less than 2,000 cases of this most contagious and fatal disease. Commencing in a large tenant-house in Mulberry Street, it was traced from locality to locality, in the poorer quarters, until it was found to have visited nearly every section of the city. It became localized in many tenant-houses and streets, where it still remains, causing a large amount of sickness and mortality.

Typhus Fever

At Mulberry Street, in a notoriously filthy house, it has existed for more than four years. This house has a population of about 320, which is renewed every few months. During the period alluded to, there have been no less than 60 deaths by fever in this single house, and 240 cases. To-day this fever is raging uncontrolled in that house, creating more orphans than many well-fought battles. Every new family which enters these infected quarters is sure to fall a victim to this pestilential disease.

The tenant-house No. — East Seventeenth Street, which reaks with filth, gives the same history; upward of 85 cases, with a large percentage of deaths, occurred in this single house during the past season. And still it remained

unclean and open to new tenants. I could mention scores of these houses in every part of the tenant-house district where typhus has apparently taken up its abode, and from whence it sends out in every direction its deadly streams.

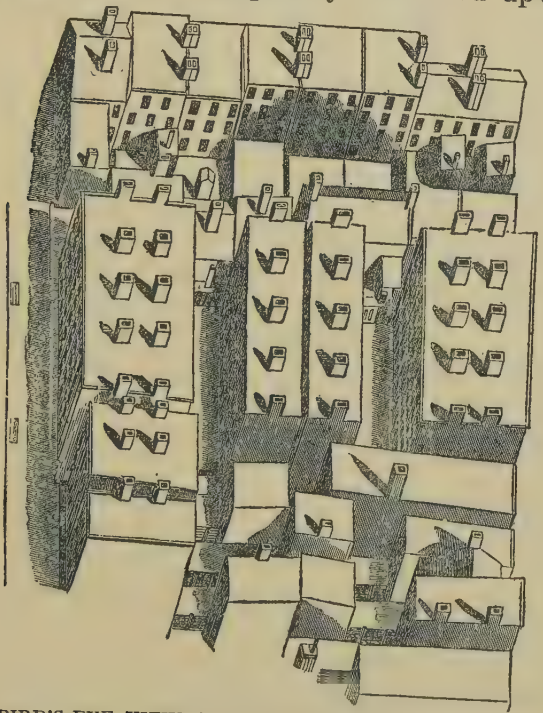


PLAN OF FEVER-NEST, EAST 17TH STREET, 1865

Here 85 Cases of Typhus Occurred in One Season

Not only have single houses become centres of contagion, but this fever has, in many instances, become localized in crowded streets, which today are almost impassable on account of the heaps of garbage, and the courts and alleys of which are reeking with filth, making them great centres of pestilence. From many of these tenements whole families have been swept away.

Jersey Street, a short but uncleaned avenue, adjacent to a fashionable part of Broadway, is another great depot of fever, which, according to these records, frequently contained upward



BIRD'S-EYE VIEW OF FEVER-NEST, 1865, NOT FAR FROM BROADWAY AND FIFTH AVENUE

of thirty cases in progress at one time. East Eleventh Street, between First and Second Avenues, now, as all the past summer, in a hor-

ribly filthy condition, is a local habitation of fever of the worst type. The same statement may be made of nearly every district where the tenant-houses are especially crowded, and the streets, courts, and alleys are unusually filthy.

Intestinal Affections

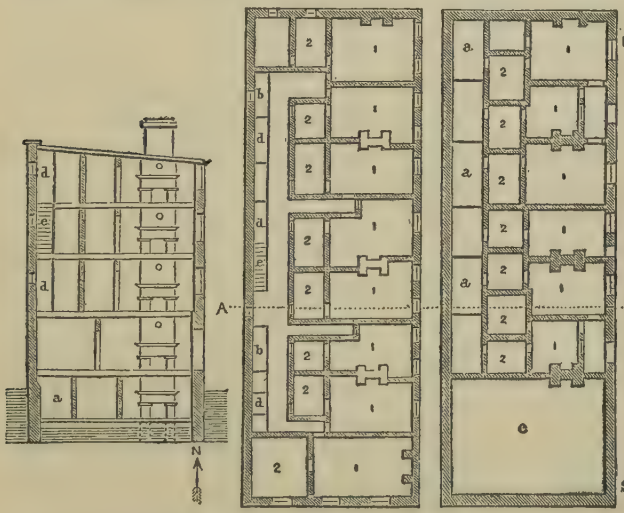
INTESTINAL diseases, as cholera infantum, diarrhoea, dysentery, typhoid fever, etc., which arise from, or are intensely aggravated by the emanations from putrescible material in streets, courts, and alleys, or from cesspools, privies, drain pipes, sewers, etc., were prevalent in the tenant-house districts, creating, as usual, a vast amount of sickness, and a large infant mortality. Very generally these diseases were directly traceable to the decomposing filth, and in some instances were stopped by the removal of the nuisance.

The Inspector of the Eighth Ward reports: "Cholera infantum has probably consigned many more to the grave during the past summer than all other diseases in my inspection district. In every case examined I have found it associated with some well-marked course of insalubrity; vegetable and animal decomposition have been the most prominent causes. That fifty per cent die from preventable causes in my inspection district I do not doubt."

The Inspector of the Sixth Ward says: "The mortality among children is fearfully high,

many families having lost all their children; others four out of five or six."

THE Inspector of the Ninth Ward says he found among the people living near the mouth of an open sewer: "That no less than twenty-nine cases of dysentery and diarrhœa,



PLAN OF MONROE STREET FEVER-NEST, 1865

five of which had terminated fatally, had occurred during the three weeks immediately preceding his inspection." He adds: "Now, when we take into consideration the fact that there are only twenty-two

Living at a Sewer's Mouth

dwellings on this square (a considerable portion of it being occupied by a large lumber-yard), and that all these cases had occurred within a period of about twenty-one days, the ratio becomes appalling. How many cases may have occurred subsequently, I have not sought to ascertain, my time being fully occupied in the inspection of the other parts of my district. But a still more direct and specific action of the poisonous emanations proceeding from this obstructed sewerage, manifested itself in the dwelling on the corner of West and Gansevoort streets, which is in the closest proximity to the outlet of the sewer. Here I learned, upon inquiry, that typhoid fever had prevailed almost continuously during the preceding winter, and I found three severe cases of dysentery at the time of my visit."

But I will not occupy time with further details of the evidence which this inspection furnishes of the vast accumulation of the causes of unhealthiness which exist in New York, and of the wide prevalence of contagious diseases arising therefrom or aggravated thereby.

The next point of inquiry is as to the effect of these conditions upon the public health of the city. Our constituted health authorities claim that notwithstanding this excessive concentration of the causes of disease around and in the homes of half of our population, the death-rate of New York is very low. To prop-

erly understand this statement, we must inquire what is the rate of death from inevitable causes.

IT has been estimated by careful writers on vital statistics that 17 in 1,000 living persons annually die from inevitable causes. That is, in a community of 1,000 persons living under circumstances such that persons die only from old age, cancer, casualties, etc., 17 will die annually, and no more. And this number is the maximum that will die without the occurrence of some disease due to a removable cause. Taking this standard as the absolute necessary death-rate, we can readily estimate the number of unnecessary or preventable deaths which occur in any community.

The Normal Death-Rate

Says the Registrar-General of England (Twentieth Annual Report): "Any deaths in a people exceeding 17 in 1,000 annually are unnatural deaths. If the people were shot, drowned, burnt, poisoned by strychnine, their deaths would not be more unnatural than the deaths wrought clandestinely by diseases in excess of the quota of natural death — that is, in excess of seventeen in 1,000 living."

TAKING this as the standard, let us see how the death-rate of New York compares with it. It is claimed by the city officials that notwithstanding the vast accumulation of the uni-

versally-recognized causes of disease, New York has a low death-rate. It is not reasonable to suppose this statement true, nor is it true, as will presently appear. It is stated very truly in the City Inspector's Report for 1863, that "it is only by taking a connected view of a period of years that a correct judgment can be formed of the state of health of a city," and upon this basis let us determine what is the mortality of New York.

Death-Rate of New York

Take the 11 years preceding the last census, viz., 1860, excluding, however, 1854, the year of the cholera. I select this period because it includes the three last census returns, and it is only where we have the census returns with the mortality records that we have accurate data for our estimates. Now, the City Inspector's own records (reports of 1863, page 192) show that during the period referred to, the death-rate of New York City was never below 28 in the 1,000, and twice exceeded 40 in the 1,000, the average being as high as 33 in the 1,000. These deductions are made directly from the City Inspector's Reports, and, as they are claimed to be infallible, these conclusions cannot be controverted.

Now, when you remember that the highest death-rate fixed by sanitary writers for inevitable deaths is 17 in 1,000, and that all deaths above that standard are considered preventable, it is apparent what a fearful sacrifice of life

there is in New York. Estimated at the very minimum death-rate of the last decennial period, viz.: 28 in 1,000, New York annually lost 11 from preventable deaths in 1,000 of her population, or upwords of 7,000 yearly, on an average, giving the enormous sum total for this period of 77,000 preventable deaths.

It may be urged that cities never can attain to this standard of healthfulness, but English writers maintain that the rate of 17 in the 1,000 is the true measure of the public health, and that even the most populous towns may yet be brought up to it. Nor can we doubt that there is much plausibility in the assertion, when we find the mortality in Philadelphia fall to 18 in 1,000, and that of London gradually descend from 30 in 1,000 to 22 in 1,000.

New York, London, and Liverpool Compared

IT is maintained, also, that New York has a lower death-rate than London or Philadelphia. Let us see how far this assertion is sustained by the records of the health authorities of those cities. During the decennial period preceding, but including 1860, and excluding 1854, as in the former comparison, the minimum mortality in London was 20 in 1,000, the maximum 24 in 1,000, the mean about 22 in 1,000. These figures are from the Registrar-General Reports.

The rate of mortality of Philadelphia for the same period was as follows: Minimum 18 in 1,000, maximum 23 in 1,000, mean about 20 in 1,000. These figures are from the report of Dr. Jewell, long the able Health Officer of that city. Placed in their proper relation, these mortality statistics read as follows: The number of deaths to the 1,000 living for the ten years, 1850—60 inclusive, but exclusive of 1854, is for

	Min.	Max.	Av.
London	20	24	22
Philadelphia	18	23	20
New York	28	41	33

If, then, New York had as low an average death-rate as Philadelphia, she would have saved 13 in 1,000 of her population during that period, or in 1860, 10,577. These figures may seem excessive, but they are careful deductions from the annual returns of the several cities. And yet it is reiterated year after year by the City Inspector, that "New York City, at this day, can lay claim to the privilege of being numbered with the most healthy in the world."

With what consummate justice did Dr. Jewell administer this withering rebuke to our pretentious official. "It is unnecessary," he says, in his report of 1860, "to comment upon this extraordinary statement, when the above figures contradict so positively the assertion. It is to be regretted that the inspector had not availed him-

self of the above statistical information, which would have obliged him to have presented a widely different statement, although one indicating a more severe pressure of sanitary evils, upon the health of their population, than his report develops."

BUT excessive as is this death-rate, it is not the full measure of the penalty which we pay to the demon of filth. A high death-rate from the diseases which it engenders or intensifies, always implies a large amount of sickness. It is estimated by competent authority that there are 28 cases of sickness for every death. On this basis of estimate what an enormous amount of unnecessary sickness exists in our midst! Nor is this a mere supposition. I have an accurate census of many groups of families of that portion of our population who live immured in filth, and here we find the constant sickness-rate excessive. It is no uncommon thing to find it 50, 60, and 70 per cent.

Constant Sickness

I WISH now to call your attention to the fact that great as is our mortality and sickness rate, its excess is not equally distributed over the entire population, but falls exclusively upon the poor and helpless. One-half, at least, of the population of New York have a death-rate no higher than the people of a healthy country

town, while the death pressure upon the other half is frightfully severe. For example, the Seventeenth Ward, which is inhabited principally by the wealthy class and has but few tenant-houses, has a death-rate of but 17 in 1,000, or only the death-rate from inevitable causes; but the Sixth and Fourth Wards, which are occupied by the laboring classes, have a death-rate varying from 36 to 40 in 1,000.

Where the Death Pressure Is Greatest

Thus it appears that while the average death-rate of the city is very high, it is principally sustained by those Wards where the tenant-house population is the most numerous. We find this excess of mortality just where we found the causes of diseases existing most numerously. And when we sift the matter further, we find that the excess of mortality is not even equally distributed over these populous poor Wards, but is concentrated upon individual tenant-houses. For example, while the mortality of the Sixth Ward is nearly 40 in 1,000, the mortality of its large tenant-houses is as high as 60 to 70 in 1,000. The following is a recent census of a large but not exceptional tenant-house of that Ward: Number of families in the house, 74; persons, 349; deaths, 18, or 53 in 1,000; constant sickness, 1 in 3; deaths of children, 1 in 6, or at the rate of 16 in 1,000.

The following table illustrates the distribution of the mortality of New York among the different classes of inhabitants at the last census:

Average mortality of entire city			28	in 1,000
Mortality of better class	10	to 17	"	"
Mortality of tenant-house	50	" 60	"	"

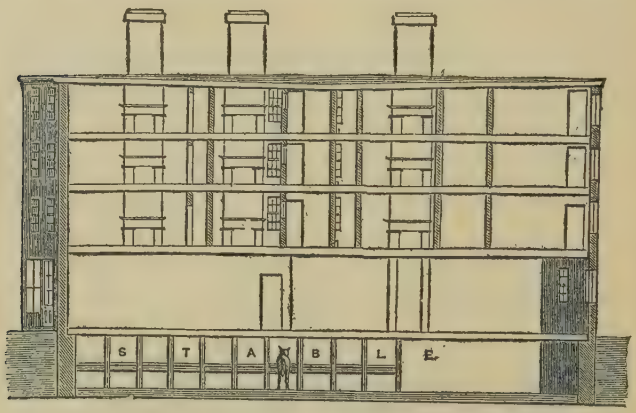
BUT I should not do justice to this branch of inquiry without noticing the alleged causes of the high mortality of New York. The first is the large foreign immigration. The reliance to be placed upon that scapegoat may be readily shown. Emigration occurs to this country under two conditions: 1. The emigrant is driven from home by famine, in which case the poorer class emigrate, or, 2, he is allured by advantages for labor or business, when the middle classes principally emigrate.

Some Scapegoats—Foreign Immigration

Now, it is under the latter circumstancees that emigration generally takes place to the United States. This is seen in the vast sums of money which the emigrants now annually bring, and the amounts which they return to their friends as the result of their labor. This class is always very hardy and healthy, as is proved by the small mortality that occurs *in transitu* being but 4.31 per cent for ten years. Besides, we have the official statements of the Commis-

sioners of Emigration that but 3 per cent remain in the city.

But the City Inspector himself shows the utter fallacy of this alleged cause of excessive mortality in his report for 1860, in which he makes the true explanation, and attributes to its proper



A SIXTH WARD FEVER-NEST WITH DEATH-RATE OF 53 IN 1,000

cause whatever increased mortality arises from emigrants. He says:

"Most of the children who arrive in this city from foreign ports, although suffering from the effects of a protracted voyage, bad accommodations, and worse fare, do not bring with them any marked disease beyond those which, with proper care, nursing, and wholesome air, could not be easily overcome. The causes of this excessive mortality must be searched for in this

city, and are readily traceable to the wretched habitations in which parents and children are forced to take up their abode; in the contracted alleys, the tenement house, with its hundreds of occupants, where each cooks, eats, and sleeps in a single room, without light or ventilation, surrounded with filth, an atmosphere foul, fetid, and deadly, with none to console with or advise them, or to apply to for relief when disease invades them."

The Floating Population

AGAIN, it is alleged that the floating population causes the excess of deaths. But it has been established by Dr. Playfair that the floating population is the most healthy. The same is true of wandering tribes, of a moving army, and equally of individuals. But when they fix their habitations or encamp, that moment the causes of disease begin to gather about them, and unless sanitary regulations are carefully observed, diseases, such as fever, diarrhoeal affections, etc., begin to prevail.

The poor population of New York is to-day but an immense army in camp, upon small territory, crowded into old filthy dwellings, and without the slightest police regulation for cleanliness. If this army should abandon its camp and begin a roving life in the country, all the diseases now prevalent would disappear. And

it must be added, that if these deserted and uncleaned tenements should immediately be filled by healthy people from the country, the new tenants would at once begin to suffer from all the pestilential diseases now indigenous to that part of the city.

I have now laid before you, as briefly as possible, the accumulated evidence that New York is to-day full to repletion with all the causes which originate and intensify the most loathsome and fatal diseases known to mankind.

This evidence proves that at least half a million of its population are literally submerged in filth, and half-stifled in an atmosphere charged with all the elements of death. I have demonstrated that the legitimate fruits of her sanitary evils is an excessively high death-rate and a correspondingly large sickness rate.

Can the Causes of Disease Be Removed?

THE all-important question which now concerns us as citizens, and you as practical legislators, is, can these evils be remedied? We answer, yes. In the first place the streets can be kept clean. Other cities accomplish this object, and therefore New York can, and we have striking illustrative examples. In certain portions of the city the streets are as clean as this floor. They are swept daily, and scarcely a

particle of dust is left in the streets or gutters the year round. But they are cleaned by private contract of the people residing upon them. What individual enterprise can do for whole squares, surely a corporation so lavish in money as New York ought to be able to do for the city at large.

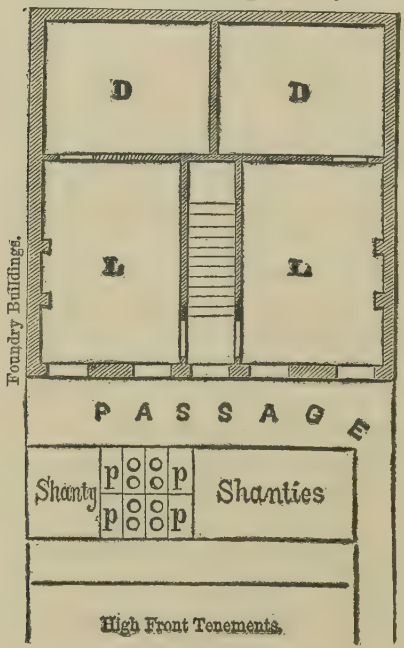
The courts, alleys, cesspools, and privies can be cleansed and kept in good condition. There are tenant-houses which are as clean in all their alleys, courts, and cellars as the best-kept private houses. These are dwellings for the poor in which the landlord takes especial interest. What is done for the surroundings of one of these houses, may be done for all. But the tenant-houses of the worst class may be quickly placed in a good sanitary condition.

Improvements During the Inspection

THE inspectors furnish many examples of this fact. They were frequently mistaken in their inspection for an official, and when their visit to the tenant-houses was reported to the landlord, he hastened to renovate the building. Some of the most filthy quarters were so completely changed within forty-eight hours that the inspectors could scarcely recognize the locality. The Inspector of the Eighth Ward says:

"The sanitary improvement in my district

during the progress of my inspection was plainly visible. Exceedingly filthy places, overflowing cesspools, and privies, which were numerous in my first visit, were suddenly cleaned. Often upon my second visit, with paper and pencil in my hand to sketch the filthy scene, I would find the quarters cleaned and whitewashed, and the air, instead of being laden with disagreeable odors, would be comparatively pure and wholesome. Many of these sudden transitions were from fear of the presumption that my inspection had some official authority; but the greater part were brought about by explaining to the people the necessity of cleanliness.



PLAN OF A TYPICAL FEVER-NEST, 1865

"Pools of filthy water from obstructions at the street corners, and accumulated along the gut-

ters, would quickly disappear, when the people would be convinced of the deleterious effect upon the public health. It will be well for the inhabitants of New York City, and especially for those of this section, when there shall be laws not only to compel them to keep their houses and surroundings clean and free from the effluvia resulting from vegetable and animal decomposition, but to prevent the overcrowding of tenant-houses, where fatal diseases are generated, and where death walks around."

How to Improve the People

THE tenant-house population is susceptible of infinite improvement, when once rescued from the reign of filth, and restored to a pure atmosphere and clean homes. The poor live in these wretched tenements because they are compelled to, and not from choice. They universally complain that they cannot escape from domestic and street filth. It surrounds and pervades their habitations, always accumulating, and never diminishing. The most tidy house-wife, compelled to live in the midst of this ocean of rubbish, with all its degrading associations, soon finds the same level, and from this she can be rescued only by giving her again a clean and well-ordered home. And such a home every municipal government is bound to secure to the poorest and humblest citizen.

Let the landlord be compelled to keep his house in good repair, supply it with an abundance of pure water, connect the privy with the sewer, open free ventilation, afford means for removal of garbage, and then keep a careful oversight of his tenants, enforcing cleanliness. If this were done, the tenant-house people would immediately improve, and the death-rate, if we may judge from other cities, would fall one-fourth.

Again, the cellar population can be removed from their subterranean abodes, and placed in better homes. Liverpool has solved this problem for us.

In 1847 that city had a cellar population of 20,000; an ordinance was passed forbidding the occupation of underground rooms as residences, with certain restrictions, and within three years the great mass of people in these subterranean haunts were removed to better tenements, with a great reduction of the mortality of the city.

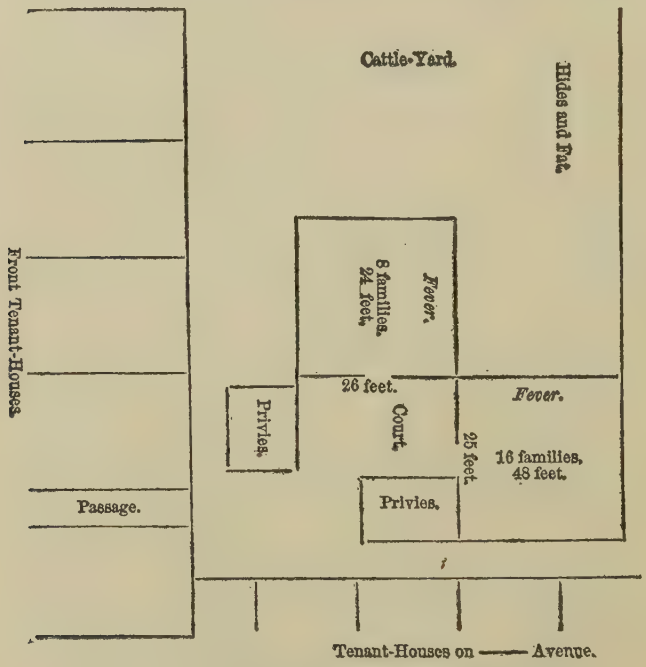
That city, formerly the most unhealthy in England, has continued the reforms thus inaugurated by compelling landlords to improve their tenant-houses, and the result is that it has become one of the healthiest towns of Europe. London has recently taken similar action in regard to cellar tenements. What these cities have done, New York can and ought to do for her public health.

WHAT the diseases which prevail with such fatality in the uncleaned tenant-houses are for the most part preventable, we have the most undoubted evidence. That smallpox is preventable is known to every school-boy, and yet that loathsome disease to-day prevails throughout all the tenant-house districts of New York, without the slightest restraint on the part of our local authorities. Typhus is to-day ravaging the homes of the poor without "let or hindrance," and yet cleanliness and pure air are sure preventives. Of this truth these reports furnish many examples.

A Town That Was Immune

The fever-nest — West Thirty-third Street — is one of a row of tenant-houses five stories high, and contains 16 families. It was in a filthy condition, without Croton water, waste-pipes stopped, sinks overflowing and emitting offensive odors; fever had prevailed all winter, nearly every person in the house having had an attack, four having died. It was never inspected by a city official. The owner was induced to clean the house, and from that date not a case of fever has occurred. The inspector who reports this case very justly adds: "If, when the first case of fever occurred in this building, the owner had been compelled to put it in a good sanitary condition, six human lives would undoubtedly have been saved, besides a great amount of sickness."

Cholera infantum and diarrhoeal affections are found in their greatest intensity where putrescible animal matter and domestic filth



PLAN OF A REAR CUL-DE-SAC FEVER-NEST, 1865

exist. Remove these causes, or remove the patients from the neighborhood, and these diseases generally disappear at once. Diphtheria is found to be most intense in the vicinity of unclean stables. It is, therefore, with great

propriety, that the entire class of zymotic diseases are now called "filth and foul air" diseases by the English sanitary writers. Remove the filth and foul air, and these diseases disappear as effect follows cause.

Can Populous Towns Be Improved?

BUT while it is admitted that the streets of a town may be cleaned, the condition of the poor improved, and diseases, under the most favorable circumstances, prevented, it may be doubted whether the sanitary condition of populous towns can be materially changed, and the death-rate greatly reduced. Yet in England, where sanitary science is enthusiastically cultivated, there is not only no doubt that large towns can be thus improved, but that the mortality of London itself may be no greater than that of the country.

Already, indeed, the London *Times* boasts "that the average of health throughout the City of London is higher than the average of health throughout all England, taking town and country together. The mortality in all England is at the rate of 22.8 in every 1,000 of the population; in the City of London it is at the rate of 22.3 for every 1,000 inhabitants! The improvement has been progressive; it has been slow, but steady and sure. Gradually the mortality has decreased, until the yearly death roll of

3,763 has been reduced to 2,904 within a period of nine years, during which the city has been under the rule of the Sanitary Commission. The deaths this year — 22.3 per 1,000, or one in every forty-five of the inhabitants — are nine per cent below the general average, and represent a saving of 286 lives. And secondly, this gratifying result has been obtained in the face of obstacles which seemed to be almost insurmountable."

Liverpool affords a striking example of the power of sanitary measures, rigidly enforced to improve the public health. It was formerly the most unhealthy city of England, being the very home of typhus, smallpox, and allied preventable diseases. But it adopted vigorous measures of reform, improving its poorer districts, and the death-rate has fallen eight in 1,000. Macclesfield, Salisbury, and many other English towns have had their mortality reduced 8, 10, and 15 in 1,000 by the vigorous prosecution of sanitary improvements. All the populous towns of that country are moving in this reform, and, as a result, the general death-rate of towns is approximating that of the country.

THE Health Officer of London announced that cleanliness would preserve a town from the visitations of epidemics. But there must be cleanliness of the streets, cleanliness of the courts, cleanliness of the apartments, and clean-

liness of the person. On the approach of the cholera in 1849 the town of Worcester, England, determined to test the theory, and set vigorously to work and cleaned the town thoroughly, removing everything of an offensive nature, and adopting the most stringent regulations against the accumulation of filth about or within the homes of the people. The result was that this "destroyer" of unclean cities made a Passover with the people of Worcester, for on every lintel and door-post was written — Cleanliness, Cleanliness. Not a house was entered, and the town was saved in the midst of the most frightful desolation.

Cleanliness Preserves from Epidemics

New Orleans is another striking example of the value of civic cleanliness. Since, by military regulations, it is kept constantly in a cleanly condition, it has had no visitation of its old enemy, yellow fever.

The degree of public health of a town is therefore measured by its cleanliness, and its capacity for health depends upon its capacity for cleanliness.

THERE is scarcely a city which has such absolute need of an efficient and intelligent sanitary government as New York. On its small territory three, four, or five millions of people are yet to be accommodated with houses.

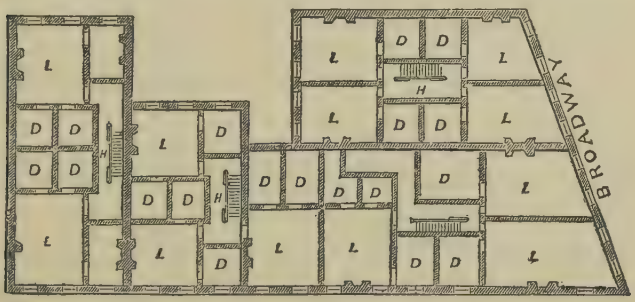
Importance of Sanitary Government

Already there are crowded upon less than eight of its thirty-two square miles all of our commercial, business, and manufacturing interests, and the houses of nearly 1,000,000 of people. And in the natural relations of the poor and rich, the former consisting of more than half of the entire population, are crowded into less than a fourth of this area. Of what vast importance is it that a wise and intelligent authority be vigilantly exercised, so that in its future growth and expansion every condition pertaining to health shall be secured to its inhabitants!

It is universally conceded that New York has in the highest degree all the natural advantages of salubrity. Its climate is the mean between the extremes of heat and cold; its topographical peculiarities are admirably adapted for drainage and sewerage; its exposure is southern; its shores are swept by two rivers, which bear seaward everything that enters them beyond the power of the flowing tide to return it; its rural surroundings are of the most healthful. In every respect it is regarded by competent observers as most favorably located for cleanliness, and the highest degree of public health. And there can be no doubt, that should New York be placed under a wise sanitary government, which would improve all its natural

advantages for health, it would become the cleanest and healthiest city in the world, and one of the most delightful places of residence.

BUT this is not a matter which concerns the citizens of New York alone. The people of the State have a vital interest in the public health of our city. Connected as it is by means



FLOOR-PLAN OF A NEW FEVER-BREEDING STRUCTURE NEAR BROADWAY AND CENTRAL PARK, 1865

of rapid inter-communication with all parts of the country, there is every facility offered for the wide diffusion of the seeds of contagion. It is estimated by accurate statisticians that no less than 250,000 persons pass in and out of New York daily over the ferries and railroads. It could not fail to happen that if any contagious disease prevailed in this city, it would be carried into the country and widely dissem-

The Entire Country Concerned

inated. And such is now a matter of daily occurrence. There is no doubt that nearly all the epidemics of smallpox in country towns, and much of the typhus and similar diseases, have their origin in New York. I have in my hand letters from all parts of the State confirming this statement. They strikingly illustrate the want of a good sanitary police in New York, and the power of a great commercial centre to scatter disease broadcast over the country.

A few of these cases will abundantly illustrate the point:

Dr. J. S. Sprague, of Cooperstown, Otsego County, reports the occurrence of twenty-six cases of smallpox in that town, communicated by one person in October, 1860, who took the disease at a hotel in our city, in which a person with the disease had recently died. He was a merchant, and came to the city on business.

Dr. C. C. F. Gay, of Buffalo, reports the case of a female, who arrived from New York in November, 1860, and was removed from the cars of the Erie Railroad to the State Line Road, and proceeded westward. As was afterward ascertained, she had smallpox, and communicated the disease at Columbus, Ohio, where there were three deaths produced by it. Four deaths were directly traceable to this exposure, viz.: three milkmen and one baggage man, all of whom came in contact with the sick woman.

W. T. Babbitt mentions the case of a young

man who took the disease in this city at a hotel where it was prevailing, at which he stopped while on a visit here, in whom the disease appeared after his return to Olean, in Cattaraugus County.

Dr. M. Jarvis, of Canestota, Madison County, relates the case of a man who visited this city with horses for sale, and was attacked with symptoms of smallpox some ten days after his return to Smithfield, in that county, who communicated the disease to his family, from whom it spread to others in that and, also, in a neighboring town.

Smallpox in a Hotel Bedroom

DR. C. M. NOBLE, of Waverley, Delaware County, mentions the case of a merchant of that place, who came to this city with his wife, and went to one of our most frequented hotels. Being very much fatigued, they retired to the room provided for them without any particular examination of it — but found in the morning that they had been put in a room from which a patient with smallpox had just been removed, without its having been cleansed. The gentleman was seized with a malignant form of that disease after his return home. Two deaths and six cases of smallpox and varioloid resulted from this case.

Dr. S. W. Turner, of Chester, Connecticut,

gives also two cases, one of smallpox and one of varioloid, in that and a neighboring place, which could be traced to this city.

Dr. Snow, the vigilant Health Officer of Providence, R. I., states that smallpox is rarely known in that city, except when imported from New York.

I COULD repeat these details until it was shown that nearly every town in the State, and nearly every city in the country, has been inoculated by New York with this most loathsome disease. The most striking and most melancholy instances of the free dissemination of contagion are found in the army, where whole regiments have been stricken with smallpox through infected clothing manufactured at the homes of the poor, where the disease was prevailing. But these are facts too well known to every medical man, and even to the community, to require further illustration.

New York Inoculates the Nation

What terror smallpox creates in country towns when it attacks its first victim, you very well know. The house where it occurs is quarantined, and not unfrequently the sufferer is deserted by his friends, and left to recover or die, as the case may be. Business with the country is often suspended by the placards posted upon the highways, with the terrifying word "Small-

pox" upon them, and a finger pointing ominously to the town. In nine cases out of ten, another finger should point toward New York, as the source of the pestilence.

It has been estimated by a competent observer, that every case of smallpox in a country town costs, by derangement of business alone, more money than is annually expended upon its public schools. If we add to this pecuniary loss the feverish excitement and popular apprehension, and the sufferings and probable death of the victim from want of proper care, we may but indifferently estimate the cost to the country of the prevalence of this disease.

Now, this diffusion of contagion from New York, we contend, is unnecessary. Every well-informed medical man knows that we may have a sanitary police so vigilant, so efficient and so powerful, that it will not only preserve the public health, but prevent the spread of disease therefrom. We hold, therefore, that you are not only called upon to protect the people of the City of New York from contagious disease, but equally that you are bound to protect the people of the State from dissemination of pestilence by every legislative safeguard which sanitary science can suggest.

THE Sanitary Committee of the Board of Health, during the prevalence of cholera in 1849, remark in their report:

"The labors of your committee, during the past appalling season of sickness and death, and the awful scenes of degradation, misery, and filth developed to them by their researches, have brought into full view the fact that we have no sanitary police worthy of the name; that we are unprotected by that watchful regard over the public health which common sense dictates to be necessary for the security of our lives, the maintenance of the city's reputation, and the preservation of the interests of the inhabitants."

Inefficiency of Health Organizations

THIS is a perfectly truthful statement of the present condition of New York. Practically, it is a city without any sanitary government. In its growith it is developing the natural history of a city that utterly ignores all rules and regulations which tend to make the homes of its people pleasant and healthy. It is the only city in the civilized world which disregards the Platonic idea that in a model republic medical men should be selected to preserve and promote the public health. Its board of health, the mayor and common council, is an unwieldly body. Its commisioners of health have limited powers, and are equally incompetent.

Without Sanitary Government

THE City Inspector's department, which alone has the machinery for sanitary inspection and surveillance, is a gigantic imposture. Of its forty-four health wardens, whose duty it should be to make house-to-house inspections, searching out the cause of disease, and using every known agency for the control and suppression of epidemics, many are liquor dealers, and all are grossly ignorant. Not one has any knowledge of medical subjects, nor dare they freely visit such diseases as smallpox, typhus, or cholera.

The City Inspector's Department

During this entire voluntary inspection, extending over six months, health wardens have rarely been known to visit infected quarters, although smallpox, fever, etc., etc., have been prevalent, and the city has been in a most disgracefully filthy condition. A single health warden recently ventured to visit a house where smallpox existed in an upper room; he sent for the attendant, and when she appeared, ordering her not to approach him, he gave the following as the best means of prevention: "Burn camphor on the stove, and hang bags of camphor about the necks of the children."

To what depth of humiliation must that community have descended, which tolerates as its sanitary officers men who are not only utterly disqualified by education, business, and moral

character, but who have not even the poor qualification of courage to perform their duties. But perhaps the most decisive proof of the utter and hopeless inefficiency of our multiform health arrangements is found in the fact that all the evils from which we now suffer have grown up under their care. A late City Inspector thus emphatically gave expression to the popular feeling in regard to existing organizations:

"With such a system, can there be a wonder that the sanitary condition of the city is not improved? * * * Nor must the consideration be kept from view, that the members of the common council, the board of health, and commissioners of health are all, from the manner of their appointment, subject to partisan influence. To expect a perfect sanitary system, under such a condition of things, is to expect an impossibility."

Sanitary Inspection

THE medical officer of health for the City of London, a gentleman of large experience, thus defines a health organization capable of answering the demands of a large and growing town: "The object of this organization lies in a word: inspection, inspection of the most constant, most searching, most intelligent, and most trustworthy kind, is that in which the provisional management of our sanitary affairs must essentially consist." The results of this

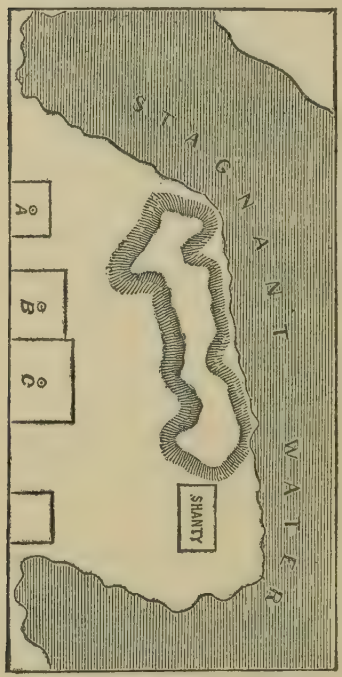
work of voluntary sanitary inspection which I have before me prove on every page the truth of the above statement. No health organization without daily inspection would have any efficiency.

Of the value of such thorough inspection in the suppression of epidemics, and in the prevention of disease, there are abundant examples. The people of a populous town of England, becoming alarmed at the approach of cholera in 1849, organized a corps of inspectors, whose duty it was to visit from house to house, and inquire for cases of premonitory diarrhoea, and when found to apply the remedy at once. The result was that cholera did not visit that town. The same systematic house-to-house visitation was adopted in some poor districts of London in 1854, and there was an almost complete exemption of those parts of the city, while some quarters of the wealthy, which were not under such surveillance, suffered severely.

Inspection Must Be Thorough

BUT it is essential that this inspection should be by thoroughly qualified medical men, and it must consist in a house-to-house visitation. Disease must be sought for, found, its incipient history completely made out, the causes upon which it depends reported, and its remedy suggested. Every case of death should be visited, and all the circumstances attending the development

of the disease, if it belong to the preventable class, should be rigidly investigated and reported, in order that the central bureau may apply the proper remedy.



FEVER-BREEDING STAGNANT WATER, EIGHTH AVENUE, BETWEEN 75TH AND 76TH STREETS, 1865

Striking examples of the value of medical sanitary inspection are furnished by this voluntary organization. One inspector found diarrhoeal affections very prevalent in a settlement in an uptown ward, and for a long time was baffled in his efforts to discover the cause. He was finally led to examine the water of a neighboring well, which the people used. This water appeared to be of an excellent quality, but on examination by Prof. Draper, it was found to contain a large amount of organic matter, derived either from a sewer

or privy. Prof. Draper pronounced it liquid poison. The mystery was at once solved, and the proper remedy suggested.

In another instance a very contagious disease was found in a tenant-house, and after a long course of inquiry it was at length discovered that a washer-woman, living in the basement, had taken in sailors' clothing. The sailors were found, the ship visited from which they came, and there the disease was found. None but medical men can prosecute such investigations with success, or suggest the proper remedy. If such a corps of sanitary inspectors were daily patrolling their districts, visiting from house to house, searching out sanitary evils, advising and aiding the people in the adoption of preventive measures, no epidemics of smallpox, typhus, scarlet fever, or cholera would ever gain more than a transient foothold. The sanitary inspector would truly become an officer of health and would be everywhere welcome.

The Remedy

THE remedy for our evils must be apparent; and this remedy is suggested in such terse unqualified language by the City Inspector above quoted, that I call the attention of the committee especially to this remark, as a proper guide in your deliberations. In the City Inspector's report for 1861 we find the following:

"The stay of pestilence, to be effectual,

must be prompt, and equally prompt must be the interposition of barriers against the introduction of disease, which may be kept back, but, once introduced, can with difficulty be checked or extirpated. For these reasons, there should be a power existing in other hands that may be ready to be used at the moment the exigency may arise." * * * "The remedy, apparent to every one, must consist in the adoption of laws transferring the power of sanitary regulations to some other authority of a different order of instruction in sanitary science." * * * "The first groundwork of reform, in the opinion of the undersigned, is to bestow upon some other body, differently constituted, all power over the sanitary affairs of the city; and, until this is done, all other proposals of reform will be deprived of their essentially beneficial features. To escape present complications is the first great point to be gained; and this point secured, simplicity, promptness, and efficiency may be substituted for inefficiency, complication, and delay."

Accepting this as the first step in reform, the practical question arises: How shall that body be constituted to which is to be confided the sanitary interests of New York?

IF the experience of other large cities is of any value, or, indeed, if we rely simply on common sense, the following are indispensable

prerogatives in any well-organized health board:

An Efficient Health Board

1. It should be independent of all political influence and above all partisan control.

2. It should combine executive ability with a profound knowledge of disease and the proper measures of prevention. To this end the board should be composed in part of men especially accustomed to the dispatch of business, and in part of medical men of great skill and experience.

3. It should have a corps of skilled medical officers as inspectors, which should be the eyes, the ears, in a word, the senses of the board, in every part of the city, searching out disease, investigating the causes which give rise to it, the conditions under which it exists, the means of its propogation, and the most effectual mode of its suppression.

4. It should have a close alliance with the police, which must be its arm of power in the prompt and efficient execution of its orders.

V

Victory

HE effect of this startling exhibition of the horrible sanitary condition of New York, both upon the joint committees and the large audience, was evidently very profound. And this effect was heightened by the early denials by the then City Inspector and his followers of the truth of the description of the condition of special localities, and the immediate exhibitions by the speaker of the sworn statements of the Physician-Inspectors of the Citizens' Association, with photographic illustrations. Pressed by members of the committee to state when he last had these places inspected, he admitted that they had never been inspected by his Department.

Effect of the Hearing

Intense interest was manifested in the custom of wholesale dealers in clothing of having their goods manufactured in tenement houses; in the fact that Inspectors had often found such clothing thrown over the beds or cradles of children suffering from contagious diseases, as scarlet

fever, measles, smallpox; and in the evidence that these diseases were distributed widely over the country by this infected clothing. Several of the committee seemed much disturbed, as did the audience, during a recital of cases, and when the hearing closed, one of the committee said to me, in an excited manner, "Why, I bought underwear at one of those stores a few days ago, and I believe I have got smallpox, for I begin to itch all over!"

Indeed, the effect of the discussion before the joint committees was so favorable, that several members declared that the bill would immediately pass both Houses without opposition. But the City Inspector secured delay by requesting another hearing, in order to investigate the facts presented in my quotations from the report of our inspection. This delay gave him the desired opportunity to defeat the bill, by means at his command and by methods familiar to that class of politicians.

But the public, and especially the medical profession, both of the city and the State, had become so interested in the measure that at the next election it became a prominent issue and led to the defeat of seventeen candidates for the Legislature of 1866 who had voted in opposition.

IT is said that epidemics are the best promoters of sanitary reform, and very opportunely cholera made its dread appearance in Europe

late in 1865, and from its rate of progress it seemed likely to visit our shores early next year. These favoring conditions led to the passage of the "Metropolitan Health Law" among the first measures of the Legislature in 1866.

Triumph at Last

The struggle and final triumph of the people of New York, in their efforts to secure adequate health protection, were national in their influence. And this influence was emphasized by the first acts of the Metropolitan Board. Scarcely had it organized when cholera made its appearance in New York. There was the usual alarm among the people, and large numbers left the city. But the new health laws and ordinances, administered by an intelligent, scientific authority, demonstrated the *raison d'être* of their existence.

The first case of cholera was promptly isolated, the house and its surroundings cleansed and disinfected, and rigid supervision established. The second case, which appeared in another part of the city, was treated in a similar manner and with the same results. A third, fourth, fifth, and finally many cases appeared in different parts of the city during the season, apparently brought from localities in the vicinity where the epidemic prevailed with its usual severity; but in New York no two cases occurred in the same place, so effectually was each case treated.

Within one month public confidence in the power of the board to control the spread of the disease was firmly established; people who had fled returned to their homes; business in commercial districts, which was at first suspended, was resumed; and the health department became the most popular branch of the city government, a position which it has maintained uninterruptedly for nearly half a century.

THIS popular triumph of sanitation is largely due to the perfection of the original Metropolitan Law, which has been declared, officially and judicially, to be the most complete piece of health legislation ever placed on the statute books. From that fountain of legal lore the whole country has been supplied with both the principles and the details of sanitary legislation.

The Reform National in Its Results

The agitation in New York rapidly extended over the entire country, and other cities secured the necessary authority, the Metropolitan Law being the basis of such health legislation. Within a decade nearly every municipality in the land had its health laws and sanitary ordinances and a competent authority to enforce them.

The enormous influence which this reform has had upon the health and domestic life of

the people can never be estimated. A reference to the former and present sickness and death-rates of New York enables us to approximate the vast saving of life and consequent prevention of sickness and human misery that has resulted from health laws founded on the Metropolitan Law and intelligently but rightly enforced. Before the passage of that law the annual death-rate of the city fluctuated between 28 and 40 per 1,000 population; since that law went into effect it has steadily fallen until it has reached the low figure of fifteen to the thousand, or a saving of more than twenty thousand lives annually when the population of New York was only about one million, and of nearly 10,000 lives of the present population. If we extend this estimate to the whole country, of ninety-five million people, we may gain a faint conception of the inestimable benefits which the application of sanitary knowledge to the daily life of a people can accomplish.

VI

The Legal Work of Dorman Bridgeman Eaton

The following chapter consists of the address delivered by Dr. Stephen Smith on the occasion of the memorial service of Hon. Dorman B. Eaton, January 21, 1899. We have inserted it immediately following his historic review of the events which led up to the great public health reform of 1865-1866, not only because it is a fitting tribute to the memory of one to whom the citizens of New York are indebted for many improvements in the administration of the municipal government, but because it brings together in one compact perspective the legal and sanitary requirements of modern preventive medicine. — F. A.

HE progress of the race is largely affected in each generation by a few pioneers who, with toil and sacrifice, prepare the way for the advance. Of these pioneers some blaze the future course in the unexplored and trackless forest; others remove the obstructions which impede the builders; while a few expert engineers bridge the rivers, tunnel the mountains and lay broad and deep the foundations of the great highway along which humanity passes to a higher civilization. Unfortunately these pioneers are not always known to public fame, and far too often, though benefactors of their race, pass away without a proper recognition of their services.

Unrecognized Pioneers

This apparent neglect is not due to a lack of appreciation of their work by the people, but rather to the fact that their labors are performed in obscurity, and hence are unknown. Far in the wilderness, or deep in the tunnel, or in the mire of the caisson, they toil all unseen

by their generation, sacrificing health and often life while seaching for the true pathway or laying its foundations. When the bridges are builded, the tunnels completed, and the broad highway is thrown open for travel and traffic, few or none of the passing throng give a moment's thought to the labors and sacrifices of the builders, or the tribute of a sigh to the memory of those who perished at their work.

Impressed with a sense of public obligation and of a duty to the memory of a citizen with whose labors and sacrifices in the interests of this city I had great opportunities to become familiar, it has been a grateful task to place on record some of the incidents in the life of Hon. Dorman B. Eaton as they came under my personal observation. He was by nature, education, and association a reformer of the civil administration. Born and bred in the rural communities of Vermont, educated at Harvard, a partner of the famous Judge Kent, of this city, and an associate of men of the type of William Curtis Noyes, Charles O'Conor, and others of equal reputation, Mr. Eaton was admirably equipped for the great work to which he devoted so much of his life and energies.

NOR was he a reformer whose methods were simply destructive of what he regarded as wrong or evil in the municipal government; on the contrary, his mind was eminently con-

structive, and consequently he sought to remedy defects by substituting the new and best for the old and worst with as little friction and disturbance as possible. Thus he quietly and without observation, as a master builder, laid foundations and reared the massive superstructures of four of the best-organized and most efficient departments of our city government — viz., the Department of Health, the Fire Department, the Department of Docks, the Police Judiciary.

A Constructive Reformer

MY personal acquaintance with Mr. Eaton began in the year 1864, when we became associated in an effort to secure reforms in the sanitary government of the City of New York. Although prior to this date there had been periods of agitation in favor of a more efficient health organization, especially when epidemics, like cholera, visited the city and the utter worthlessness of our health officials became apparent, yet there had been no such organized effort as that of 1864. Previous agitation had, however, been very useful in preparing the way for the final struggle, by creating a popular interest in these reforms and in rendering the public mind both sympathetic and receptive.

Character of Previous Agitation

IN 1855 the Academy of Medicine applied to the Legislature for relief from the evils of an insufficient health organization, and as a result a committee of that body investigated the sanitary condition of the city. It appeared that there were four separate departments devoted to the conservation of the public health. First, was the Board of Health, composed of the Aldermen and Mayor. When this body was organized as a Board of Health it had supreme power, both in the abatement of nuisances and the expenditure of money. So much and so justly was this board feared, that Fernando Wood, while Mayor, refused to call it into existence during an epidemic of cholera, declaring that the Board of Health was more to be feared than the pestilence.

Incompetent Health Officers

Second, was the Commissioners of Health, composed of the Mayor and the Recorder, the City Inspector, the Health Commissioner, the Resident Physician, and the Port Health Officer. This body had no adequate power and was perfectly useless both for good and evil.

Third, was the Resident Physician, whose duties were limited to visiting the sick poor.

Fourth, was the City Inspector, a most formidable official politically, for he had the right to expend annually $1,000,000 without "let or hindrance." His jurisdiction extended to the clean-

ing of the street, gathering vital statistics, and preserving the public health by the appointment of health wardens for each ward.

The investigation showed that this department, the only one which actually exercised public health functions, was permeated with corruption, ignorance, and venality. The City Inspector was the lowest type of ward politician, the vital statistics were crude and unreliable, there was no pretense of cleaning the streets, and the health wardens were for the most part keepers of saloons. It was shown in the evidence that no health warden ever dared to visit a house where there was a case of contagious disease. One, who was asked the best method of preventing smallpox, replied: "Burn sulphur in the room." Another, asked to define the term "hygiene," said: "It is a mist rising from wet grounds."

THE report of this committee created a profound sensation and gave the first impetus to a reform movement. A number of prominent physicians and influential citizens became deeply interested in the subject and determined to secure proper legislation. Health bills were annually prepared and sent to the Legislature only to be rejected under the direction of the City Inspector, whose $1,000,000 was expended

Reform Movement Born

freely in the lobby at Albany. But the agitation increased in force with successive defeats, a large and still larger number of people were added to the ranks of the reformers of the Citizens' Association in 1864, with Peter Cooper as President and upwards of a hundred of the leading citizens as members.

The moving spirit in organizing and managing this powerful body was Mr. Nathaniel Sands, an ardent and enthusiastic sanitarian. Two departments were created in the Association, through which the principal work was to be done; viz., a Council of Law and a Council of Hygiene. Mr. Eaton was an active member of the former, and I was for a considerable time Secretary of the latter. Thus we were brought into frequent consultation over a public health law, which the Association had determined to have prepared for the next Legislature.

It was decided that the Council of Hygiene should make a first draft of the bill in which should be incorporated the necessary sanitary provisions. This draft was then to be submitted to the Legal Council for completion in legislative form. As secretary of the Council of Hygiene I had to prepare the first draft of the bill, which was done along the lines of former bills and seemed to the members to be a very perfect piece of work. When, however, the bill came from the Legal Council, scarcely a shred of the original draft was recognizable.

THOUGH the Legal Council was composed of the leading lawyers of the city at that time, the revision and completion of the health law was committed to Mr. Eaton, a junior member. This selection proved to be of immense importance to the immediate sanitary interests of this city, and secondarily to the creation and administration of the health laws of the United States. The field of sanitary legislation was entirely uncultivated in this country at that time, and the principles on which health laws should be based were unrecognized, except by the more advanced students.

The Right Man

Mr. Eaton fortunately proved to be one of the few citizens who had kept pace with the progress of sanitary reforms in England, and entered fully into the spirit of the great movement that for a quarter of a century had agitated the people of that country. Alarmed by the high death-rate annually reported by the Registrar-General, and informed that the larger part was due to preventable diseases, the public demanded adequate remedial measures of the government. The contest was long and most exciting, the issues often being carried into the arena of politics. The Prime Minister once declared that there was such a craze about sanitation that the rallying cry of an election campaign might well be *"Sanitas sanitatum, et omnia sanitas."*

The triumph of the reformers was finally complete, and England adopted a code of health laws that are models of excellence, and which, in their enforcement, have made its cities and towns the healthiest in the world.

When our health bill came from the hands of Mr. Eaton it was evident in every line that he had made an exhaustive study of the English health code and had become thoroughly imbued with its spirit. The language was not altogether familiar, and in the involved sentences there were intimations of extraordinary powers quite unknown to our jurisprudence. When he brought the completed bill before the Legal and Medical councils for adoption it was subjected to a most searching criticism. While most of its sections were clear and readily understood, there were portions which were so obscure, owing to the methods of expression employed, that the legal members were in doubt as to the proper construction to be put upon them, while the medical members were altogether at a loss as to their meaning.

MR. EATON explained the theory of modern health legislation as illustrated by the English laws, and contended that a thoroughly organized and efficient board of health must have extraordinary powers, and must not be subordinated to any other branch of the civil service, not even to the courts. What it declared

to be a nuisance — dangerous to life and detrimental to health — no one should call in question. When it ordered a nuisance to be abated within a given fixed time no mandate should avail to stay its action or the enforcement of its decree.

A Board With Extraordinary Powers

A board of health, in his opinion, should make its own laws, execute its own laws, and sit in judgment on its own acts. It must be an *imperium in imperio.* England, the foremost country in the world in the cultivation of sanitary science and in the application of its principles to practice, had by its legislation for a quarter of a century established a precedent which it was right and safe for us to follow.

He predicted that if this bill became a law its operations would be so beneficial that it would not only become very popular in this city, but that it would be the basis of future health legislation in this country. He believed, however, that no legislature would pass a bill containing such powers if these powers were made a prominent feature of the bill. For that reason he had adopted that involved expression peculiar to English law which required a judicial interpretation to determine the precise meaning. The bill was approved in the form presented by Mr. Eaton, and preparation was made to secure its passage.

AS the City Inspector with his health wardens always appeared at Albany when a health bill was before the Legislature, denying vociferously the alleged unsanitary condition of the city, Mr. Eaton advised that the Association make a careful inspection of the city with its own inspectors. This inspection was organized by the Council of Hygiene and prosecuted during the summer of 1864 by young physicians, and was the most exhaustive study of the sanitary condition ever made of a city, even by officials. The results were published in a large volume which has been pronounced by authorities at home and abroad as equal to the best official reports of European cities.

The Fight for the Bill

The bill was early introduced into the Legislature of 1865. In due time it came before a joint committee of both houses, with Senator Andrew D. White in the chair. The City Inspector, with his health wardens, was present, and a large attendance of members with several prominent citizens of New York. At Mr. Eaton's request I described the deplorable sanitary condition of the city as revealed by our inspections and explained the medical features of the bill. He followed with a brilliant and exhaustive speech on the nature of sanitary legislation and the value to cities of adequate health laws administered by well-organized boards of health.

At the conclusion of the hearing the members

of the committee assured us that if the two houses were in session they would pass the bill at once. But we were doomed to disappointment. The City Inspector secured delays, and meantime employed through his agents the means at his command to defeat the bill. The agitation, however, was continued during the year, chiefly through the *New York Times,* then under the management of Mr. Raymond, an ardent reformer.

MR. EATON advised the Medical Council to interest the physicians of the country, and especially urge them not to nominate men who had voted against the bill in the last Legislature. This plan was carried out, and seventeen former members failed of renomination to the Assembly. The result of this scheme succeeded admirably, for the new Legislature was to some extent pledged to support the bill when they came to the capitol. The bill promptly passed both houses early in the session of 1866, and in March the Metropolitan Board of Health was organized. Mr. Eaton accepted the position of counsellor to the board, which position he retained several years.

A Law Enacted and Sustained

As he had anticipated, a suit against the Board was early commenced to test the constitutionality of the law. He was very apprehensive

of the results, and made the most thorough preparation to argue the case. He was successful in the lower courts, and finally won in the Court of Appeals by a majority of one. He always regarded his success in the management of this case as one of the most important events of his life, for on the decision of the highest court depended the fate of health legislation in this country.

The Regeneration of New York

NO one unfamiliar with the sanitary condition of this city prior to 1864 can form any adequate conception of the enormous benefits conferred, not only upon this metropolis, but upon the entire country, by the labors of Mr. Eaton and his associates in securing to it the Metropolitan Health Law. During the former period New York was a prey to every form of pestilence known to man. Smallpox, the most preventable of contagious diseases, was epidemic in this city every five years, and created a large death-rate among the children. Scarlet fever and diphtheria spread through the city without the slightest effort on the part of the officials to control them. Cholera visited us once in ten years without any adequate measures of prevention. The mortality was greater than of any other city of a civilized country, it being estimated that 7,000 died yearly from preventable diseases.

The tenement-house population lived under the most unhealthy and degrading conditions, a prey to greedy landlords, and without any possible relief or redress. In one notorious building, which covered an ordinary city lot, were fifty families, with a total population of five hundred persons.

Here every form of domestic pestilence could be found at all seasons of the year. Still more deplorable was the condition of the tenants of cellars. Of these so-called "Troglodytes" there were 5,000 living in rooms the ceilings of which were below the level of the surface of the street.

To the present generation it may appear incredible that there was neither law, ordinance, nor department of the city government capable of giving the slightest relief. This was illustrated in an attempt to break up a fever nest in 1860. The landlord refused to make the slightest repairs, or cleansing, in a tenement house from which upwards of one hundred cases of fever have been removed to the hospital.

The attorney to the Police Department was unable to find any law or ordinance by which he could be compelled to cleanse, repair, or vacate the house. It was only by confronting him in court, to which he had been brought on a fictitious charge, with a reporter, that he was induced to take any steps to improve the tenement.

NOW everything relating to the public health is so changed that it is almost impossible to realize the condition of the city in 1866. The change began with the very organization of the Metropolitan Board. Within a few days of that event, cholera, which had devastated portions of Europe, made its appearance in this city; but it met with a far different reception than that of former visitations. The first case was quarantined within an hour of its occurrence; the clothing of the patient was destroyed, the room disinfected, and a sanitary guard placed over the house. No other case appeared in that quarter of the city. There were several similar outbreaks in different parts of the town, but each was treated with the same vigilance and energy, and the contagion never secured a foothold in the city or the metropolitan district.

Epidemics Checked

Though cholera has since appeared in Europe at its usual intervals, and has several times been at our doors, it has not been able to invade the city for a period of thirty-four years. Smallpox, which once decimated the child population every five years, has not been epidemic in a whole generation. Diphtheria and the whole brood of domestic pestilences are diminishing in frequency and fatality. Even consumption, so common and fatal among the poor, is rapidly disappearing in consequence of the improved condition of the tenement houses.

And what a vast change has been made in the homes of the poor! No human habitation is underground; the ancient rookery, with its five hundred inhabitants, is a past number; the dark, foul courts are disappearing, and in their places have arisen the modern tenements, with their light, airy, and cheerful apartments, and all the conditions necessary to family health and domestic happiness. The laws and ordinances all conspire to compel the landlords to remedy every defect on complaint of the tenant; the penalty being that the latter need not pay rent until the home is made habitable in a sanitary sense. The vital statistics show that human life is lengthening in this city, and that the entire metropolis is more healthy as a place of residence than the sorrounding country towns.

Sanitation in Other Cities

BUT the beneficent results of the labors of Mr. Eaton and his associates in the field of sanitary legislation are not confined to New York. As he predicted, the Metropolitan Health Law became the basis of sanitary legislation throughout the country. At the time of its enactment the municipalities of the United States were as destitute of health laws and regulations as the City of New York. Today there is not a city, or even village, that has not its laws and ordinances relating to the preservation and promotion of the public health

based on the original law drawn by Mr. Eaton. And the same remark is true of the organized health administration of the States of the Union, for on analysis it will be found that their sanitary legislation is in harmony with the provisions of that law. Mr. Eaton's work was broad and fundamental.

Reorganization of the Fire Department

AT that period the old Volunteer Fire Department was quite as discreditable to the city as was its health organization. Intrenched in the political organizations of the city, it wielded a power second only to that of the great political parties themselves. It required the strength and courage of a Hercules to purify this department by removing the existing elements, reconstructing the entire organization, substituting a paid for a volunteer membership, and requiring a high grade of qualification of its officers.

But, aided by the Citizens' Association, Mr. Eaton undertook this reform, and after a fierce and prolonged struggle carried it to a successful conclusion. The law creating the fire department, like that creating the health department, is a model of intelligent discrimination of all the conditions essential to the efficiency of the service and its permanent freedom from the vices inherent in the old system.

SCARCELY had these reforms been perfected when Mr. Eaton's attention was turned by the Citizens' Association to the necessity of having a department in the city government devoted exclusively to the care and management of the public docks, wharves, and other water-front interests of the city. This movement resulted in the passage of the law drawn by Mr. Eaton creating the Department of Docks. Though this Department was to occupy an entirely new field in the Municipal Administration, the law shows in every section the same mastery of all the details peculiar to Mr. Eaton's legislative work.

Creation of a Dock Department

FINALLY, Mr. Eaton undertook, single-handed, to reform the police judiciary. He prepared a bill creating the civil magistrates to take the place of the police justices and reforming in many particulars the methods of procedure. This law is regarded as a great improvement upon the previous police judiciary, but the bill became a law only after a protracted struggle with the old police justices, a struggle which Mr. Eaton maintained alone, relying upon the merits of the measure which he advocated. The consensus of opinion of legal authorities is that the new law effected

Reform of the Police Judiciary

radical reforms of great importance in these inferior courts of criminal jurisprudence in New York City.

Mental Traits of Dorman B. Eaton

IF we may estimate Mr. Eaton's mental traits by the laws which he drafted in the interests of municipal reform, we can readily conclude that he had a remarkable genius for constructive legislation. Though he was compelled to weave into the very woof of those laws, extraordinary powers, which he acknowledged were of vital importance to their efficiency, and yet would be a menace to the public, if the laws were administered by unscrupulous persons, he succeeded in so guarding those powers that these laws have been in operation upwards of a quarter of a century; and, while those who have from time to time been called to administer them have not always had the best reputation for intelligence and civic virtue, yet there has at no time been any complaint of injustice in their execution, nor has there been any serious lapse in their vigorous enforcement. To-day, as a generation ago, they are accomplishing the full measure of usefulness for which they were designed by their author.

Standing now at the close of a life so largely devoted to the service of his fellow-men and consecrated to the amelioration of human suf-

fering, and where we may, in some slight degree, estimate the vast and ever-increasing fruition of its labors, how sublime it appears! Monuments and memorials can but faintly symbolize its greatness and perpetuate its enduring force. Mr. Eaton's own thought of true fame once was expressed to me thus: "I ask only to be remembered as one who in his sphere of life's duties endeavored to improve the conditions of human life around him."

VII
The Occult Power of Filth

IN the retrospect from the vantage ground of half a century of sanitary progress we recognize that during the third quarter of the last century the people of England were waging a successful war on domestic uncleanliness as a contributory, if not the sole cause of epidemic diseases. The health officer of England insisted that domestic filth was the actual cause of many of the low forms of disease, and named them accordingly, "filth diseases." This official act of the highest health authority of that country led to the practice of cleanliness in the home and its surroundings. Filth in every form was removed as the necessary remedial measure against these diseases, with the result that not only were foreign pestilences prevented, but the whole brood of domestic diseases was greatly reduced in number, and the severity of cases that did occur was greatly diminished in virulence.

Filth Diseases

But during the fourth quarter of the last cen-

tury the question arose among scientists, "Why is filth — that is, decomposing matter — the prolific cause of disease?" The answer came from the famous Pasteur of Paris, and Lister of Edinburgh. "Filth is dangerous, because it is filled with germ life. The mere removal of filth from one locality to another does not render it harmless, except to those who are no longer in personal contact with it." So-called filth was indeed harmless if the germs it contained were killed.

The Scheme of Sanitation Changed

THE whole scheme of sanitation was at once changed: agents that would kill germs were eagerly sought by many scientists, and germicides were found in abundance. Cremation was most effectful, and was available in the destruction of masses of filth; but there was a phase of the question that required other methods.

Lister announced that these disease-producing germs entered wounds and prevented healing, and that a germicide was required which would kill the germ in the wound and would not injure the living, healthy tissue. Further investigations showed that these dangerous germs were not confined to dust heaps, but existed in the unclean recesses of the human body.

Sternberg startled the world with the announcement that an unclean human mouth contained germs of the most poisonous character.

An eminent German surgeon declared that germs of a dangerous character existed in the folds of the skin of the palms of the hand which no amount of washing with soap and water could remove, and could be destroyed only by some agent directly applied.

Sanitation of the body as well as of the dust heap now became the paramount question and especially did this apply to the practice of surgery.

The Mystery of Infection

HOW infection affects the body was the supreme mystery that the scientists of the past strove in vain to penetrate. By no devices of their laboratories could they detect the agents that caused the epidemic. There was only one satisfactory explanation of the origin and spread of the devastating plagues, which seemed to fall from the heavens on the people, and that was that epidemics were "a visitation of God" on account of the sins of the people. Of course, the only preventive and curative measure available and effectual was "repentance, prayer, and humiliation."

It is a cause of devout thankfulness that while these things were hidden from the "wise and

prudent" of former times, they have in these latter days been revealed unto "babes." No event in human history would have more greatly taxed the credulity of the most learned and experienced physician of half a century ago than the prophecy that in the early years of the twentieth century school children would be taught by simple and easily understood object lessons how to prevent and how to cure consumption, the Asiatic cholera, yellow fever, and other epidemics that have devastated cities, destroyed armies, and swept from the earth whole tribes of primitive people.

But that prophecy has been literally fulfilled. During the last summer there has been a traveling object lesson that visited the different sections of the State of New York and taught the people, especially the children, all the essential facts as to the nature of the infection of tuberculosis, its effects on the body, and the methods of prevention and cure.

AS infective diseases cause the vast majority of cases of severe and crippling affections and of deaths in every community, the value of a knowledge of the nature of infection and how it affects the body, by the people of all ranks, ages, and conditions, cannot be estimated in its influence on the future of the human race. Already we learn that within the period referred to the sickness and death-rates of communities

How Infection Works

where the people have been most thoroughly instructed as to the nature of infective diseases, and how they affect the body, have greatly diminished, and the average human life has been markedly lengthened. Indeed, it now seems possible to restore the patriarchal age when a man may live to be "an hundred and twenty years old . . . his eye . . . not dim, nor his natural force abated."

To understand how infection affects the body involves an inquiry as to the nature of infection, its mode of entrance into the body, and its operation on its organs and tissues. The terms "infection" and "contagion" are often used as synonymous; but a strict definition according to the medical significance of each limits the former to "the transmission of disease by actual contact of the diseased part with a healthy absorbent or abraded surface," and the latter to "transmission through the atmosphere by floating germs." But in the final analysis the cause of disease in both infection and contagion is so similar in its action that the medical profession has adopted the term "communicable disease" in all cases where the disease is communicated from one person to another by means of a germ, whatever may be its method of attack on the body. The common characteristic of "communicable diseases" is their germ origin.

WHAT is this communicable germ or agent? A bacterium — a little stick, staff — so called from the rodlike shape it assumes in the process of growth. The individual bacterium (plural, bacteria) is an organism representing a low form of vegetable life; resembles mold; in size the smallest living thing that can be seen with the microscope; in masses forming the films floating on foul fluids or covering decomposing animal or vegetable matter. It consists of a single cell, and its mode of increase when placed under proper conditions of growth is by division of the cell body; the two cells formed out of the first being divided into four before complete separation has taken place; the four dividing into eight, the eight into sixteen, the sixteen into thirty-two, and so on indefinitely.

What the Germ Is

Now, as it requires only thirty minutes for one cell to divide, it has been estimated that a single bacterium will in twenty-four hours increase to the number of over sixteen million five hundred thousand, and in forty-eight hours to two hundred and eighty-one million five hundred thousand. At this rate of increase, in three days there would be a mass of bacteria weighing about sixteen million pounds. As the multiplication of bacteria depends upon conditions that soon interfere with or interrupt their growth, as the want of food, their own secre-

tions, and certain natural forces operating against them, these stupendous figures are useful only as an illustration of the enormous fertility of these organisms, and their destructive energy when they attack a susceptible living body.

The Function of Bacteria

WHAT is the function of bacteria in the economy of nature? It would be surprising if such a menace to human life as some species of bacteria have proved themselves to be had no other place among the forces of nature than to prevent the too rapid increase of the human race on this earth, as our forefathers believed. It is gratifying, and quite satisfying to a revengeful spirit, to learn from the modern laboratory that the special and only function of the bacterium is to perform the duties of a universal scavenger. It is always seeking to decompose animal and vegetable matter. It lives on filth, riots in it, and dies when deprived of it. It enters the human body only in search of filth, and if it finds none it does the person no harm, and dies either from the want of food or by starvation, or escapes from the body, or secretes itself where it may safely await the creation of decomposing matter, when it will begin its life-work.

Thus, there may be and doubtless is at all

times a great variety of bacteria of a virulent type, quiescent in our bodies only for the time that they find no decaying matter adapted to their special tastes or wants.

It is a most interesting fact, therefore, that this most deadly foe of man becomes dangerous only when the latter is harboring in his body waste or decomposing matters that are slowly poisoning him. It is in the process of digesting this material that the bacterium excretes poisons — toxins — of the most virulent nature, which are absorbed into the blood of the human victim, creating the condition popularly known as blood poisoning.

Bacteria perform a most important function in the economy of nature, viz., the conversion of decaying and dead matter into food for plants. Biologists assert that without bacteria plant life on the earth would be scanty or entirely wanting; they are the natural intermediaries between plants and animal in point of food production. They are therefore called scavengers, because they live on decomposing matter; but in the very act of digesting such waste they convert it into products essential to plant life (carbon dioxide and ammonia) and by their excretions restore to vegetation its chief supply of food.

It appears on the same authorities that bacteria not only assist materially in maintaining vegetable and animal life on this planet, but

"in the arts and industries they are as essential to modern economic life as are the ingenious mechanical inventions of men. Many secret processes now in use in the arts and manufactures are but devices to harness these natural forces. Thus in the manufacture of linen, hemp, and sponges, in the butter, cheese, and vinegar industries, in tobacco-curing, etc., bacteria play an important rôle."

IT naturally occurs that to meet the various conditions under which decomposing matter exists in nature there is a great variety of species of bacteria, each species being adapted to a special field of operations. These species are distinguished from one another by the shapes they assume during their growth, some being rod shaped (the bacillus), others spherical (the coccus), and others spiral (the spirillum). Under one of these divisions the various species are classified.

Bacteria for Every Condition

In these latter days of popular knowledge of scientific progress, but without precise information of details, bacteria are associated in the public mind with disease, especially of the epidemic form. While this prejudice is useful in stimulating the people to adopt and enforce preventive measures against conditions that tend to promote bacterial life in their homes and in their own persons, yet it should be un-

derstood that comparatively few of the great number and variety of bacteria are pathogenic, or disease producing, in man.

So throughout the animal kingdom we find that few are susceptible to a common disease; or, in other words, that the same species of bacteria attack in equal force several varieties of animals.

The explanation of this peculiarity is found in the variations of the quality or intimate nature of the tissues and organs of different species of animals. The same may be said of our own bodies — the several organs vary greatly in their susceptibility to the attacks of the different kinds of bacteria; hence the latter are classified as specific and nonspecific, according as they cause specific or nonspecific disease.

The distribution of bacteria is limited only by the existence of plants and animals; that is, the existence of decomposing vegetable and animal matter. Though they are more abundant in the earth where such matter is found most abundantly, yet they abound in the air, the water, on plants, animals, and insects, on our own bodies, and in every cavity leading to the exterior. As bacteria are always searching for food, the number present is a sure indication of the degree of cleanliness of the thing, individual, or locality where they are found.

The movements of bacteria from one point to another are through the medium of some

other mode of conveyance than their own bodies afford. Thus they are borne by the water, by vegetation, by animals of every kind, especially insects, by the air on particles of dust. The typhoid bacillus, borne in water and milk, has caused innumerable epidemics of that dreaded disease.

The Deadly Tubercle Bacillus

THE tubercle bacillus is borne on the air through the medium of particles of dust, and in cities where the victims of tuberculosis scatter these germs profusely in the streets, public conveyances, churches, and places of resort, in the act of coughing, sneezing, and spitting, the dust borne on the winds is a constant and most fertile source of infection of tuberculosis. In a city like New York thousands are annually infected by the dust-borne tubercle bacilli, not only by inhaling them in the street, but even more certainly in the quiet of their homes, where the germ-bearing dust accumulates in clothing, bedding, carpets, rugs, and upholstered furniture, and is daily forced into the air of the living rooms by broom and duster.

Foul as is the air of the unventilated tenements of the poor, it has been demonstrated that the dust which saturates the furniture, carpets, rugs, and hangings of residences of the wealthy contains sixty per cent of street filth.

An authority says, "The most widely distributed pathogenic microörganism (disease-causing bacterium) in the air is the tubercle bacillus, the cause of consumption and a large variety of other ailments, such as hipjoint disease, caries of the spine, etc. Over one hundred thousand persons die annually from consumption alone in the United States, and it is estimated that there are over two million people afflicted with the disease in one form or another. All of these sufferers are expectorating billions of tubercle bacilli daily."

How Bacteria Affect the Body

CONSIDERING the second inquiry as to how infection affects the body, we must constantly bear in mind that a bacterium, though a scavenger, is a conservator of nature. Its real function in the orderly processes of animal and vegetable life is to utilize waste for the preservation and promotion of animal and vegetable life on this planet where the conditions are so favorable to both.

Therefore, wherever we find bacteria in the active processes of growth, that is, multiplication, we may be assured that they have found matter that should be rescued from waste and converted into useful food for plants. It follows that when we find a bacterium actively growing in any part of our bodies, it has found some

form of decaying matter that is not only no longer useful to our bodies, but is in fact harmful and should be removed.

It is also important to understand that waste matter is found under a great variety of conditions, and that for its proper conversion into useful food for plants there must be a correspondingly large number of species of bacteria each having its special field of operation. It is due to this variety of bacteria that there are so many infective diseases; for each species of bacteria creates its own individual form of disease.

This statement requires the following explanation, viz., a bacterium in a quiescent state is harmless; everyone has within his body innumerable bacteria, as the tubercle and typhoid bacilli; but they are inert, and hence innocuous. It is only when they find their proper food, decaying matter, that they begin to multiply, and in that act they secret a poison, toxin, which is absorbed, and, entering the circulation, causes in the individual a special class of symptoms peculiar to that toxin, or poison.

These symptoms constitute a disease, the technical name of which is usually fanciful, depending on some feature of the symptoms, but explaining nothing as to its essential nature.

For example, the typhoid bacillus finds its food in certain minute glands of the small bowels. If these glands are in a perfectly

healthy state when the bacillus enters the digestive tract, the germ will pass over them and disappear from the body perfectly harmless. But if the bacillus finds its appropriate food — dead or decomposing matter — in the glands, it at once takes up its abode in them and "begins housekeeping;" that is, it begins to multiply according to the method of fission of its cell and rate of multiplication, already described. During this process the multiplying cells excrete a toxin, which, being absorbed, creates a fever, the result of a true blood poisoning. This fever is called typhoid, because its prominent symptom, stupor, resembles that of typhus fever. The name, therefore, signifies nothing as to the nature of the disease.

The Toxin Secreted

THE poisoning of the body by the excreted toxin of the multiplying cells, which is simply plant food, occurs because it is removed only in part by the digestive organs, the circulation that conveys it to the other eliminating organs being efficient for that purpose. Could all of this toxin be removed as fast as it is excreted, and not enter the circulation, there would be no fever.

The termination of this process must be either the death of the colony from exhaustion of the food supply in the glands, or the exhaustion of the patient by the excess of toxins that ac-

cumulate in the body. As the activity of the bacillus depends upon the food supplied, the severity and length of the fever varies in different individuals. Some are immune, because the glands that furnish the food of the typhoid bacillus are in a state of high health; others have a brief and mild attack, because the food supply is scant owing to a slight impairment of the integrity of the glands; but with a considerable number in every epidemic the food is ample to sustain the creation of an immense colony of bacilli which destroys the victim by an overdose of poison.

The final disposition of the typhoid bacilli, after a course of fever, was believed to be by their elimination from the body through the various organs devoted to the discharge of waste products; but recent investigations have proved that the typhoid bacillus may remain in the body for long periods without apparently affecting the health of the person, but when communicated to another, it will cause an attack of fever of the most virulent type. In one instance an outbreak of typhoid fever was traced to a woman who had fever upward of fifty years ago. It was found that the excretions of her body contained immense quantities of living typhoid bacilli. She was a cook by trade, and it was found on tracing her history that wherever she had worked there had been epidemics of typhoid.

A still more remarkable feature of the life history of the typhoid bacillus has recently been made public. A typhoid epidemic was traced to a nurse who had attended cases of typhoid fever, but had never suffered from an attack of that disease, and yet was discharging large quantities of the bacilli. These cases can be explained only on the theory that these microörganisms find some place, possibly, as has been suggested, in the gall bladder, where they find food sufficient to keep them in an active state of multiplication, but where the conditions prevent the absorption of the toxins they excrete.

How far these curious incidents in the life of the typhoid bacilli are common to other bacilli is not known; but if it is true of other infectious diseases, the fact will explain the origin of those obscure and mysterious cases that occur without any known exposure to the infection.

IN concluding this inquiry as to the nature of infection and its effects on the body, the following statement of a biologist as to the bacterium seems justified: "When it enters a living body, it aims directly at the destruction of the latter. It multiplies rapidly, tends to scatter its broods throughout the tissues, and all the while gives off the most powerful poisons. This agent is wickedly implacable, neither giving nor ask-

ing quarter. The battle that it wages with the body can terminate only by the destruction of one of the combatants."

Bacteria Aim to Destroy the Body

Viewed in the light of the past history of infectious diseases, this is not an overdrawn picture. If we estimate the deaths from smallpox in ancient times, from cholera in modern times, and from tuberculosis (consumption) throughout all time, the destruction of human life by bacteria cannot be overstated. The bacterium has been a wickedly implacable foe to the human race in the past. Invisible, intangible, everywhere present, it has proved omnipotent in its destructive attacks upon communities.

But our century opens with a far brighter outlook for the race. Elementary forces which, through ignorance of their true functions in the economy and conservation of nature, were permitted in the past to expend their energy in the destruction of life, have been revealed by science to be man's most helpful agents in the promotion of comfort, health, and longevity. Electricity was for ages only a thunderbolt, an object of terror, and an agent of destruction, visiting the human residence only to kill its owner and burn the structure.

To-day the same natural force is man's most obedient and humble servant, quietly visiting his home to furnish him heat and light, annihi-

lating time in the transactions of business, and transporting him from place to place as on the lightning's wings.

So the bacterium, once the terror of mankind as the invisible and apparently unknowable cause of devastating pestilences, proves to be the useful purveyor of the by-products of man's digestion of waste matter which is thereby converted into food for plants. It visits man in the pursuit of its humble calling to obtain his contribution to the sum total of plant food. It searches every tissue, every organ, every recess, however obscure, but so stealthily that its coming and going and its immediate presence are not known if absolute cleanliness of the body exists. It is only when dying tissues or organs, or accumulations of dead matter, are found that its presence becomes known. Even then it would prove harmless and its presence would be unrecognized if its excretions of plant food (toxins) were not necessarily absorbed and did not enter the circulation, thus poisoning the body it is relieving of dead matter.

BRIEFLY, what are man's defenses against bacteria? Chiefly two, viz., first, killing it by depriving it of food; and, second, killing it directly by what are known as germicides. The first method is effected by cleanliness of the person. It may be affirmed that cleanliness, without and within, absolutely protects every

man, woman, and child from the most common disease-producing bacteria.

Man's Defenses

It is not sufficient to keep the skin clean by daily baths, while the mouth, nose, throat, and other internal surfaces and organs are covered or filled with effete matter. We must be every whit clean if we would escape the results of the scavenging processes of bacteria of some variety or species.

That condition can be secured and maintained in an organism that itself is constantly decaying in all of its tissues and organs only by strict compliance with the natural laws governing the operations of the body as an independent organism in which all of its forces tend to promote its health and conservation. Every tissue and every organ has its special means of renewal of its tissue by the removal of dead particles through the outlets and the reception of fresh material through the inlets of the body. Waste and supply are exactly balanced, as in the most precise and delicate machine. If the outlets become clogged, so that all the waste cannot escape at that proper time, dead matter, the food of bacteria, begins to accumulate, and disease must result.

In the same manner, if the food is in excess of the demands, or of a quality not suited to the needs of the tissue or organ, waste begins to accumulate, bacteria swarm in the decomposing

mass, and emit their toxins, which, absorbed into the circulation, cause a variety of physical disturbances according to the species of bacteria present, and the particular tissues the toxins affect, as the nervous system, stomach, heart, kidneys, etc.

That even the most feeble minded may be able to regulate their habits so as to secure an adequate supply of food both in quality and quantity, and the prompt removal of waste matter, so as to secure that degree of cleanliness of internal organs essential to escape from bacterial attacks, the mechanism of the body is endowed with instincts that make it automatic in its action. Such are appetite and taste for food and drinks; the desire for exercise, rest, and sleep; the impulse of the organs in an active state, etc. It is only when these natural monitors are interfered with that the mechanism begins to fail in its elimination of waste, and bacteria find the conditions favorable for their functional activity.

THE second defensive measure is the destruction of the bacteria by means of agents that will destroy the microörganism before or after its entrance into the body, but without injuring the healthy tissues. There is a great variety of these agents of more or less power, and they are used in the form of gases, liquids, and powders, according to conditions existing in in-

dividual cases. In general, it may be advised that, as bacteria are everywhere, germicides ought to be used far more extensively than they are for the purposes of securing not only the direct destruction of bacteria, but of removing or neutralizing dead matter, the food of bacteria.

Destroy the Bacteria

So minute are bacteria, and so adherent are they to material things, that mere bathing with water does not remove them, medicate it as we may with fancy soaps. There should be used in addition a more penetrating and destructive agent, which would not only destroy all forms of bacteria, but at the same time secure absolute cleanliness.

IT would be impossible even to summarize, except in a volume, the vast number of so-called germicides that have been brought to the attention of the public for use; but in the practice of surgery the chief reliance is placed upon those agents which simply oxidize organic matter, and thus destroy the germ without injuring living tissue, as do all forms of caustic preparations. The saving of life by these new measures far exceeds that effected by simply removing the material that contains the germ, without destroying the germ itself.

The Value of Germicides

It is impossible to estimate the resources of

science in its efforts to discover the ultimate conditions that govern the origin and spread of all the pestilential diseases; but its revelations during the last quarter of a century are a prophecy and a promise that the whole brood of domestic contagious and infectious diseases will disappear during the present century from the homes of English-speaking people; largely because the lessons of cleanliness are being learned, not only the lessons of cleanliness of the home, but also personal cleanliness — a form of cleanliness that is more than washing with soap and water, — that kind of cleanliness which kills germs, removes the substances in which they live, and disinfects and makes aseptic and healthy the surrounding tissues.

VIII
A Closing Word

LEANLINESS is indeed next to Godliness," is an oft-quoted saying of John Wesley. Bacon stated the maxim thus: "Cleanness of body was ever deemed to proceed from a due reverence to God." The Hebrew Fathers, from whom this sanitary principle was derived, resolved the doctrines of religion into "Carefulness; Carefulness into Vigorousness; Vigorousness into Guiltlessness; Guiltlessness into Abstemiousness; Abstemiousness into Cleanliness; Cleanliness into Godliness."

Cleanliness Next to Godliness

This religious creed was doubtless based on the Mosaic sanitary code, and was the preventive measure against pestilences which the great Jewish law-giver approved. How generally and how long the "Chosen People" adopted and practised this method of protection against epidemic diseases does not appear, but it is quite certain that in later days it had been discarded.

THE Hebrew Fathers could have had no conception of the invisible agencies in filth that made uncleanness such a powerful factor in the propogation of epidemic pestilences and domestic contagious and infectious diseases. It was reserved for the scientists of the recent past to discover the exact nature of the infective germs of communicable diseases, their origin, their development, their modes of infection; in other words, their life history.

Invisible Agencies in Filth

This discovery revealed the fact that filth in every form, whether in the rubbish-heap, the toilet, the garbage, the dust of the floor, or even in the folds of the hands and feet, the secretions of the skin and glands, is a culture bed for germ-producing diseases. The secret of the great power of cleanness as the true remedial measure for the prevention of pestilences is now apparent and every citizen must recognize that the obligation of applying that remedy rests with himself.

The Great Awakening, in the middle of the last century, of the people of England, and subsequently, of this country, to the intimate relations of filth, in all forms in and around their dwellings, to the prevalence and fatality of cholera, typhus fever, and other communicable diseases, has restored cleanliness to its ancient imperial position as chief of the virtues, and

the most reliable private and public means of conserving health.

THIS awakening, due both in England and America to trivial incidents, forms one of the most interesting chapters in human history. Already the outcome has been an enormous reduction of the mortality of English-speaking peoples, an immense increase in the length of life, and an advance in the arts of living, which insures a higher civilization by securing to every citizen a sound mind in a sound body.

A Higher Civilization